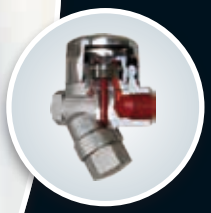
Product Guide 2014



MIYAWAKI®

Advanced Solutions for Steam and Condensate Management

About MIYAWAKI

More than 80 years Experience, Technology and Quality

The company MIYAWAKI has more than a 80 year history as one of the leading steam trap manufacturers in Japan.

MIYAWAKI is the number one supplier of steam traps for oil refineries and chemical plants in Japan.

It is the world leader in the production of temperature control steam traps, the most effective steam traps for steam tracing and steam main lines in the sense of energy conservation.

Our mission

Kensuke Miyawaki, President, member of the executive board of MIYAWAKI Inc.

”MIYAWAKI‘s mission is to promote the ideas of energy saving and environmental pro tection, to fulfil the deliveries of its products with a high rate of reliability, and to provide a high level of technical support for each transaction.

Reducing the consumption of energy in the form of steam is an extremely important energy saving policy goal of each modern industrial enterprise. Steam Traps are able to play an important role in this process, because by improving the organisation of steam handling and collection, they can reduce up to 40% of the steam losses which are not caused by manufacturing, thus making such equipment very effective and necessary for steam and condensate systems.

We have every confidence that the high quality of MIYAWAKI products will enable our customers, to save energy and to meet their financial goals.”

Our history

MIYAWAKI opened its doors in 1933 and began designing steam traps for industrial use. In 1949, after extensive experiments and tests, MIYAWAKI developed an entirely new type of steam trap, with a “Duplex”-type valve, a double-ported valve operating by the pressure differential to increase discharging capacity.

In the following years, the design was further refined and sales soared to the point where by 1953, MIYAWAKI Steam Trap Manufacturing Co., Ltd. was able to incorporate. Along with the development and sales of products other than steam traps, the name changed to MIYAWAKI Inc. in April 1986.To emphasize the growing international activities of MIYAWAKI Inc., the subsidiary company MIYAWAKI GmbH was established in Germany in June 1991. In the 1990s, the network of sales representatives around the world was enlarged considerably.

MIYAWAKI is operating today on a worldwide scale with representatives situated not only in Japan, but also in South East Asia, Europe and America.

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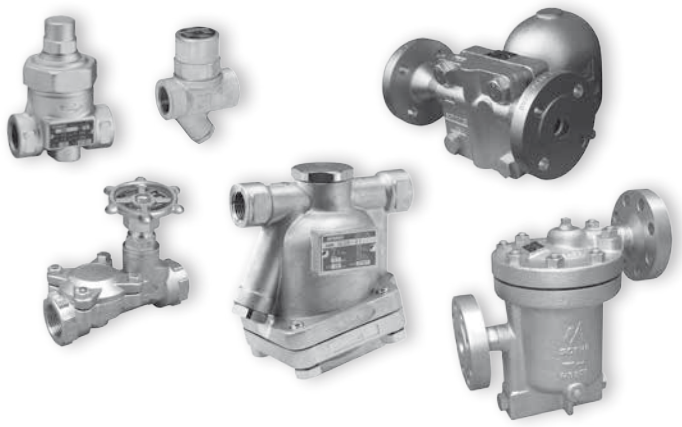
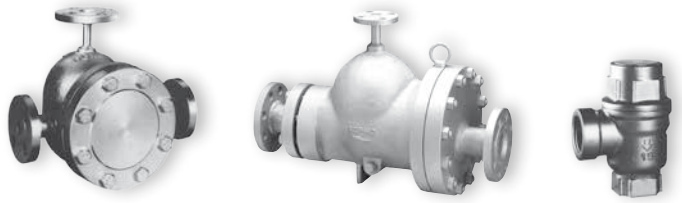
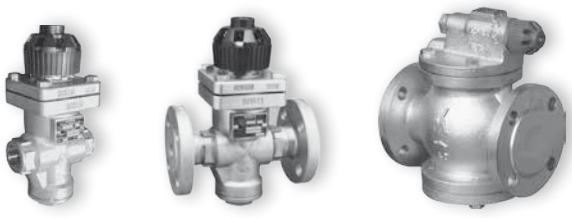






		First Choice	Second Choice
Steam Mains	< 1,6 MPa	**TB9N**	**GC1, D, S, ES**
	< 2,1 MPa	**TB7N**	**GC1, S**
	< 6,4 MPa	**TB51, TB52**	**S61N, S62N, ESH**
	< 19,6 MPa	**TBH71/72, TBH81/82**	
Process Equipment	Heater	**G, ES, ER**	**S**
	Heat Exchanger	**G**	**ES, ER**
	Vaporizer	**G**	**ES, S**
	Distiller	**D**	**ES, S**
	Sterilizer	**D**	**ES, G, S**
	Cylinder Dryer	**ES, ER**	
	Band Dryer	**G**	**ES, ER, D**
	Multi-Platen Presses	**G**	**ES, D, S**
	Vulcanizer	**D**	**S, ES**
	Tyre Presses	**D**	**S, ES**
	Autoclaves	**D**	**G, ES**
Laundry Equipment	Dryer	**G**	**ES, D, S**
	Tumbler	**ES, ER**	**D, S**
	Presses	**D**	**S, ES**
	Steam Mannequins	**D**	**ES, S**
	Steam Iron	**SL3**	**SD1**
	Steam Mangles	**D, G**	**ES, S**
Food Processing Equipment	Process Boiling Pans	**G**	**ES, D**
	Hot Tables	**D, G**	**ES**
	Jacketed Boiling Pans	**D**	**G, ES, S**
	Tilting Pans	**ES**	**D**
	Brewing Pans	**G**	**ES, D**
	Evaporator	**G**	**ES, ER**
	Retorts	**G**	**ES, ER**
Heating & Air Conditioning	Steam Radiator	**W**	**D**
	Unit Heaters	**G**	**ES**
	Convectors	**W**	**D, ES**
	Radiant Panels	**W**	**D, ES**
	Air Heater	**D**	**ES, G**
	Air Humidifiers	**ES, G**	**D, S**
	Heating Coils	**D, ES**	**G, S**
	Air Conditioning Units	**ES, G**	**D**
	Calorifiers	**G, ES**	**D**
Tracing	Steam Tracer Lines	**TB**	**D**
	Tank Heating	**TB**	**D, ES, S**
	Copper Tracing (Instrument Tracing)	**TB1N**	**DC1**

Disclaimer: This Guide is offered as a recommendation guide only and is not intended to replace the selection by a qualified person.

Quality, Performance and Challenges to energy saving

Since 1933, MIYAWAKI has committed itself to a policy of **uncompromising quality, performance and challenges to energy conservation.**

Research and development has a high priority at MIYAWAKI. To meet industry´s demands and to ensure quality, MIYAWAKI invests heavily in the best personnel, facilities, manufacturing techniques and quality control systems available today.

This policy of **„Technology First“** has resulted in major advances in steam trap design and operation.

As a result of the certification MIYAWAKI can assure all our customers of its continuing policy of high quality standards and of the fact that all products are manufactured in accordance with international regulations and technical requirements.

ISO 9001-2008


ISO 9001
Management System Certificate
Certificate Number : JMI-0205
MIYAWAKI INCORPORATED
1-30 2-CHOME, TAGAWAKITA, YODOGAWA-KU, OSAKA-SHI, OSAKA, JAPAN
ISO 9001 :2008 / JIS Q 9001 :2008
JAPAN QUALITY ASSURANCE ORGANIZATION
TOKYO, JAPAN

ISO 14001-2004


ISO 14001
Management System Certificate
Certificate Number : JQA-EM1403
MIYAWAKI INC.
HEAD OFFICE / PLANT
2-1-30 TAGAWAKITA, YODOGAWA-KU, OSAKA-SHI, OSAKA, JAPAN
ISO 14001 :2004 / JIS Q 14001 :2004
JAPAN QUALITY ASSURANCE ORGANIZATION
TOKYO, JAPAN

European Directive 97/23/EC


Certificate
Monitoring of Final Assessment
according to Directive 97/23/EC
Certificate No.: 01 202 JÜ-4041923
MIYAWAKI INC.
2-1-30 Tagawakita, Yodogawa-ku
Osaka 532-0021, JAPAN
CE 0035
Tested acc. to Directive 97/23/EC:
Internal manufacturing checks with monitoring of the final assessment (Module A1)
Test report no.: 4041923M
Description of pressure equipment: Gas or Steam Trap and valve in category I and II
Manufacturing plant: Miyawaki Inc. 2-1-30 Tagawakita, Yodogawa-ku Osaka 532-0021, JAPAN
The regular monitoring of the final assessment established that the requirements of the Directive are met. The next monitoring is due by end of October 2014.
Yokohama, Oct. 29, 2013
TÜV Rheinland Certification Body for Pressure Equipment
Dipl.-Ing. Abe
www.tuv.com
TÜVRheinland®
Precisely Right.

AD 2000-W0


CERTIFICATE
The TÜV Rheinland Certification Body
for Pressure Equipment
hereby certifies that
MIYAWAKI INC.
Osaka, Japan
has been inspected and approved according to
AD 2000-Merkblatt W0
The scope of the inspection is given in the annex to this certificate
All pertinent requirements are met.
Certificate No. 01 202 JIAD-02 0028
valid until September 2014
Yokohama, Oct. 28, 2011
TÜV Rheinland Certification Body for Pressure Equipment
www.tuv.com
TÜVRheinland®
Precisely Right.

Certificate of Conformity Russia


РОССИЙСКАЯ ФЕДЕРАЦИЯ
СЕРТИФИКАТ СООТВЕТСТВИЯ
№ C-JP.АБ45.В.00001
ТР 0558851
ЗАЯВИТЕЛЬ
ИЗГОТОВИТЕЛЬ
ОРГАН ПО СЕРТИФИКАЦИИ
ПОДТВЕРЖДАЕТ, ЧТО ПРОДУКЦИЯ
СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ ТЕХНИЧЕСКОГО РЕГЛАМЕНТА (ТЕХНИЧЕСКИХ РЕГЛАМЕНТОВ)
ПРОВЕДЕННЫЕ ИССЛЕДОВАНИЯ (ИСПЫТАНИЯ) И ИЗМЕРЕНИЯ
ПРЕДСТАВЛЕННЫЕ ДОКУМЕНТЫ
СРОК ДЕЙСТВИЯ СЕРТИФИКАТА СООТВЕТСТВИЯ с 19.10.2010 по 18.10.2015
Руководитель (заместитель руководителя органа по сертификации)
Эксперт (эксперты)
Н.В. Фадеев
М.М. Пономарева

Rostechnadzor Permit


ФЕДЕРАЛЬНАЯ СЛУЖБА
ПО ЭКОЛОГИЧЕСКОМУ, ТЕХНОЛОГИЧЕСКОМУ И АТОМНОМУ НАДЗОРУ
РАЗРЕШЕНИЕ
№ РРС 00-33563
Срок действия разрешения до 01.04.2014
Дата выдачи 01.04.2009
Заместитель руководителя
А.В. Фирсонников

MEMO

Temperature Control Steam Traps

SERIES TB

Temperature Control Steam Traps are bimetallic steam traps which do not follow the steam saturation curve. The discharge temperature can be adjusted manually, which allow these steam traps to adopt to a wide range of applications, where optional undercooling is possible and where sensible heat savings and flash steam reduction are desirable. These steam traps are perfectly fitted for reducing the steam consumption at steam main and steam tracing lines thus guaranteeing a high degree of energy savings.

Types

TB7N & TB9N	with forged steel body for low and medium pressure applications
TBC2	with stainless steel body for low pressure tracing
TB1N	with steel body for low pressure applications
TB51/52	with forged steel body for high pressure applications
TBH71/72/81/82	with cast steel body for high pressure applications

Features

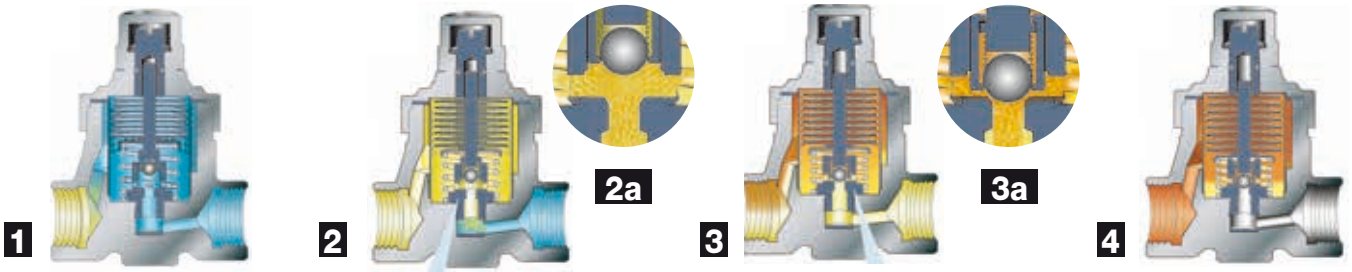
- All traps are equipped with the patented valve mechanism SCCV®-System (see pages 74 – 75).
- The SCCV®-System ensures a superior closing performance in the center of the port, greatly reduced wear of the internal parts and extended life of the trap.
- Highly efficient in energy conservation – eliminates virtually 100% of steam loss.
- Continuous discharge of the condensate according to the adjusted temperature – not influenced by inlet pressure changes.
- Inline repairable – easy and quick replacement of the bimetal unit and the seat.
- Readjustment possible while the trap is in operation (for low pressure applications).
- All traps equipped with integral strainer.
- Can be installed both horizontally and vertically.

Suitable for:

TB7N	Steam main lines and tracing lines
TB9N	Steam main lines, tracing and small heat exchanger applications with specific condensate undercooling
TBC2, TB1N	Steam tracing lines
TB51/52	High pressure steam main lines
TBH71/72/81/82	High pressure steam main lines

Operating principle

cold condensate hot condensate



1) On start-up, the bimetal discs are all flat and the valve shaft is up with the valve fully open. Virtually all cold condensate and air are discharged.

2) As the temperature of the condensate increases, the bimetal discs begin to curve gradually and force the valve shaft and the valve holder to move down.

2a) Most of the condensate is still discharged quickly, since the valve and the holes in the fixed guide on the valve seat are still fully open.

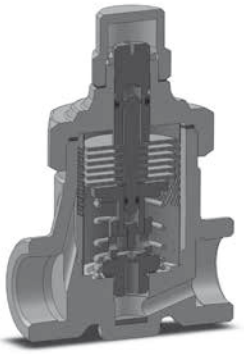
3) When condensate with higher temperature (near to set temperature) flows in, the bimetal discs are curved even more and at the same time the valve shaft moves down and the valve holder closes the holes in the guide partially.

3a) The amount of condensate being discharged is reduced quickly. This prolongs the time that the hot condensate stays near the bimetal discs and the heat of the condensate is transferred to the bimetals much more effectively.

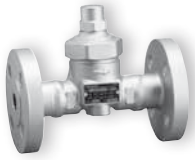
4) In case of very low condensate flow, the holes in the guide are closed completely by the valve holder and the valve will close precisely in the center of the seat. Normally, the trap is filled with hot condensate and the operation will rest in the state shown in figure 3. Condensate will be discharged continuously at a stable temperature (very close to the set temperature).

SERIES TB Bimetal Temperature Control Trap

TB7N



Screwed & Socket Weld



Flanged Connection

with Ball Valve

with Blow Valve

Available options **TB7N**

- with ball valve (TB7NB-C)
- with blow valve (TB7NB-R)

Special version **TB7N-P**

with maximum operating pressure
2,7 MPa / 392 psig

Special face-to-face dimensions available.

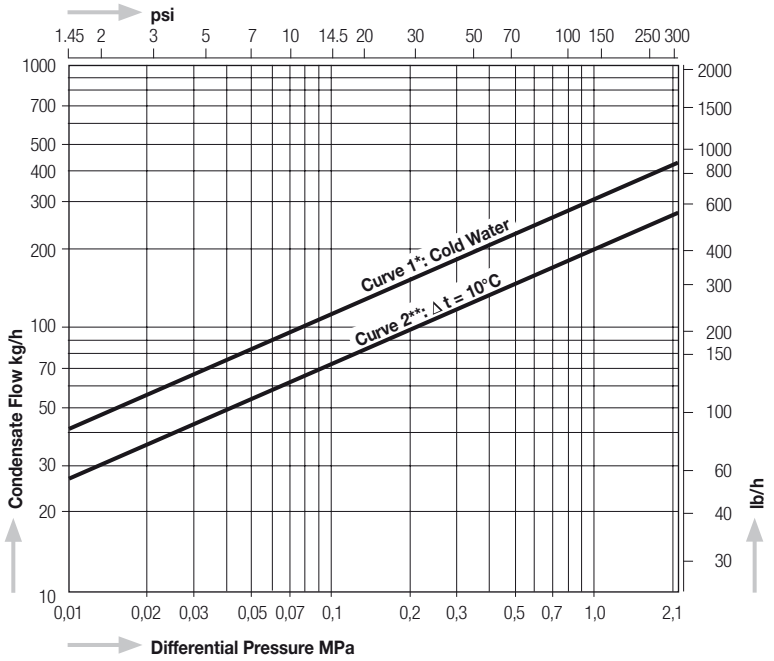
* **Curve 1** shows the trap's maximum capacity when discharging cold condensate at a temperature of 20°C (68°F).

** **Curve 2** shows the trap's maximum capacity when discharging hot condensate at a temperature of 10°C (18°F) below the adjusted temperature of the trap.

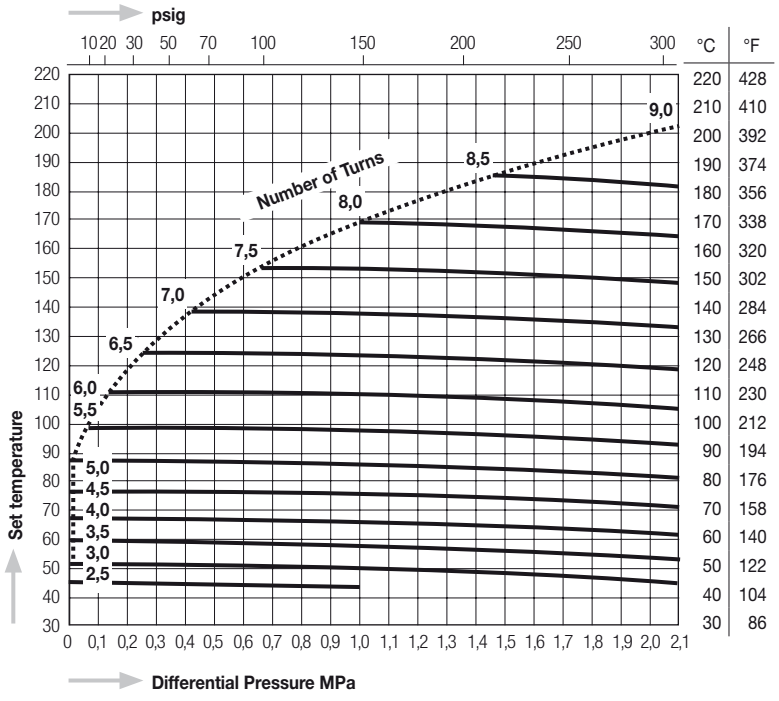
Standard factory settings*:
100°C at 1,0 MPa (212°F at 145 psig)
* Settings may differ in various regions.
For more information please contact us.

Max. allowable pressure (PMA) = 4,0 MPa (580 psig)
Max. allowable temperature (TMA) = 400°C (752°F)

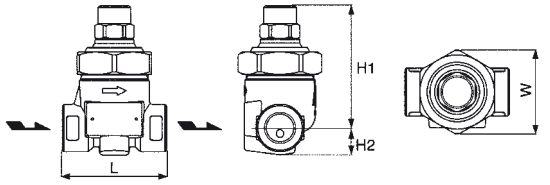
Capacity Chart **TB7N**



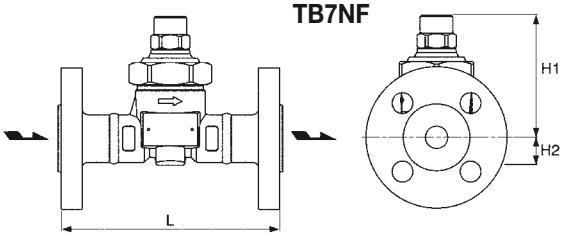
Temperature Stroke Chart **TB7N**



Dimensions **TB7N • TB7NW**

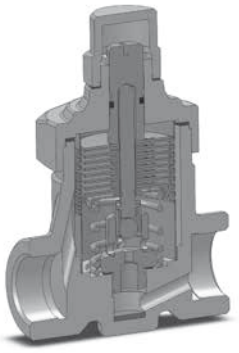


TB7NF

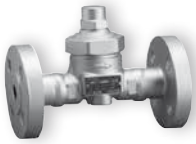


Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Adjustable Range		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
TB7N	Screwed Rc, NPT	½"	2,1	305	350	662	50 – 200	122 – 392	70	82	18	56	2.75	3.2	0.7	2.2	Forged Steel A105	1,0	2.2
		¾"							80		19		3.1		0.75			1,1	2.4
		1"									23				0.9			1,2	2.6
TB7NW	Socket Weld JIS, ASME, DIN	½"	2,1	305	350	662	50 – 200	122 – 392	70	82	18	56	2.75	3.2	0.7	2.2		1,0	2.2
		¾"							80		19		3.1		0.75			1,1	2.4
		1"									23				0.9			1,2	2.6
TB7NF	Flanged JIS, ASME	½"	2,1	305	350	662	50 – 200	122 – 392	145	82	18	56	5.7	3.2	0.7	2.2		2,6	5.7
		¾"									19				0.75			3,1	6.8
		1"									23				0.9			4,2	9.2
	Flanged DIN PN40	15							150	82	18	56	5.9	3.2	0.7	2.2		2,7	6.0
		20																3,3	7.0
		25							160				6.3					3,9	8.6

TB9N



Screwed & Socket Weld



Flanged Connection

with Ball Valve

with Blow Valve

Available options **TB9N**

- with a ball valve (TB9NB-C)
- with a blow valve (TB9NB-R)

Special face-to-face dimensions available.

* **Curve 1** shows the trap's maximum capacity when discharging cold condensate at a temperature of 20°C (68°F).

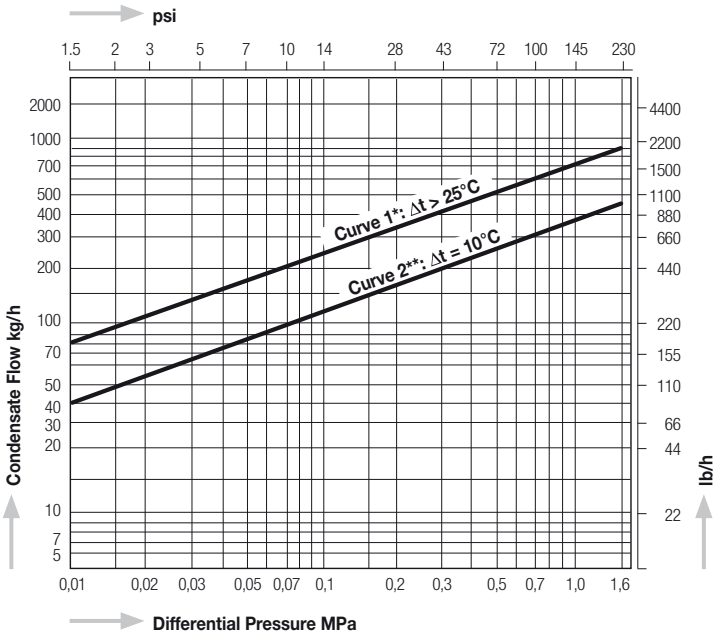
** **Curve 2** shows the trap's maximum capacity when discharging hot condensate at a temperature of 10°C (18°F) below the adjusted temperature of the trap.

The dashed line shows the standard factory setting:
100°C at 0,5 MPa (212°F at 73 psig)

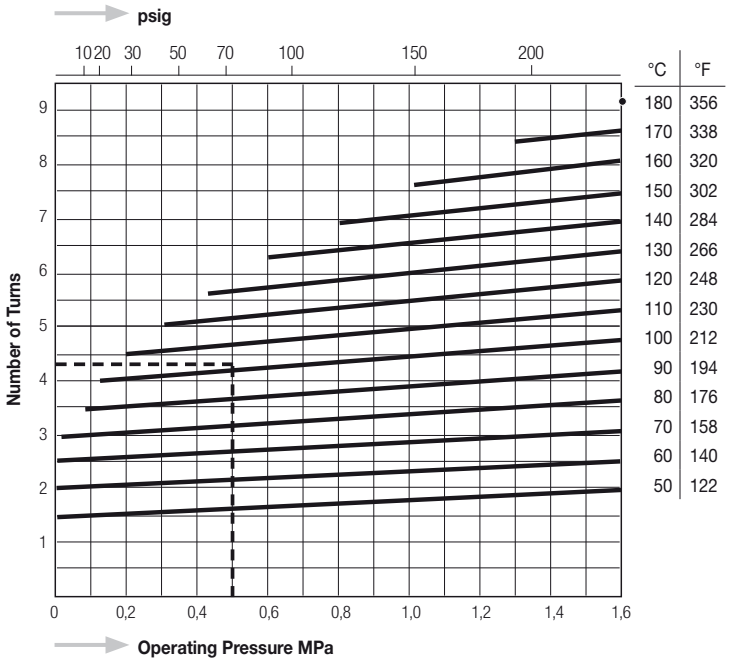
Max. allowable pressure (PMA):
4,0 MPa (580 psig)

Max. allowable temperature (TMA):
400°C (752°F)

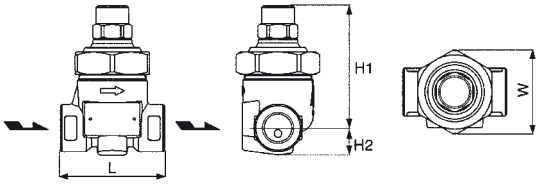
Capacity Chart **TB9N**



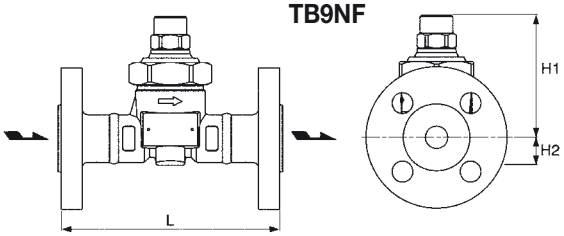
Temperature Stroke Chart **TB9N**



Dimensions **TB9N • TB9NW**



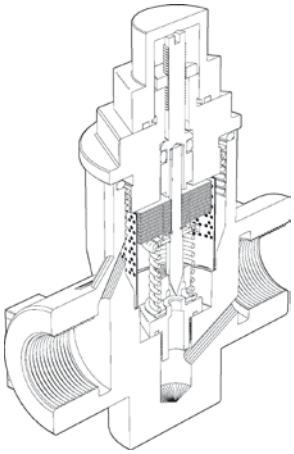
TB9NF



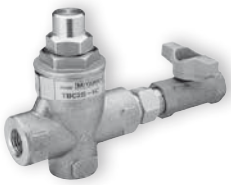
Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Adjustable Range		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
TB9N	Screwed Rc, NPT	½"	1,6	230	350	662	50 – 180	122 – 356	70	82	18	56	2.75	3.2	0.7	2.2	Forged Steel A105	0,9	2.0
		¾"							80		19		3.1		0.75			1,0	2.2
		1"									23				0.9			1,1	2.4
TB9NW	Socket Weld JIS, ASME, DIN	½"	1,6	230	350	662	50 – 180	122 – 356	70	82	18	56	2.75	3.2	0.7	2.2		0,9	2.0
		¾"							80		19		3.1		0.75			1,0	2.2
		1"									23				0.9			1,1	2.4
TB9NF	Flanged JIS, ASME	½"	1,6	230	350	662	50 – 180	122 – 356	145	82	18	56	5.7	3.2	0.7	2.2		2,6	5.7
		¾"									19				0.75			3,4	7.5
		1"									23				0.9			4,0	8.8
	Flanged DIN PN40	15							150	82	18	56	5.9	3.2	0.7	2.2		2,6	5.7
		20																3,4	7.5
		25							160				6.3					4,0	8.8

TBC2, TBC2B

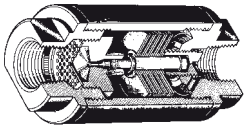
TB1N



Basic Type



with Ball Valve



Available option **TBC2**

with a Ball Valve (TBC2B-C)

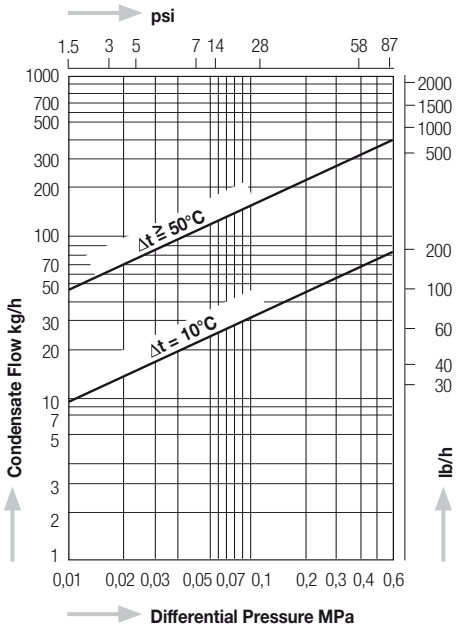
Special version **TBC2-10**

Operating pressure range:
0,5 – 1 MPa (73 – 145 psig)

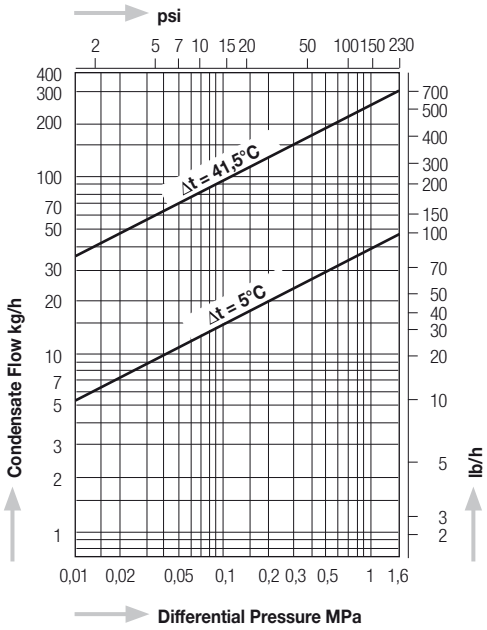
Standard factory setting:
70°C at 0,5 MPa; 158°F at 73 psig

The dashed line
shows the standard factory setting.

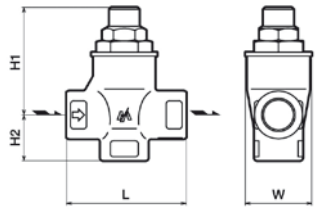
Capacity Chart **TBC2/TBC2B-6**



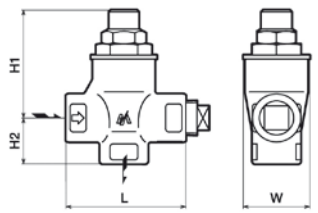
Capacity Chart **TB1N**



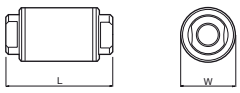
Dimensions **TBC2-6**



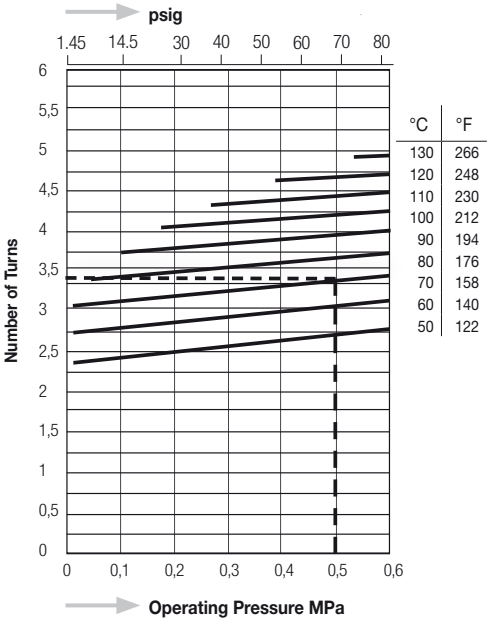
TBC2B-6



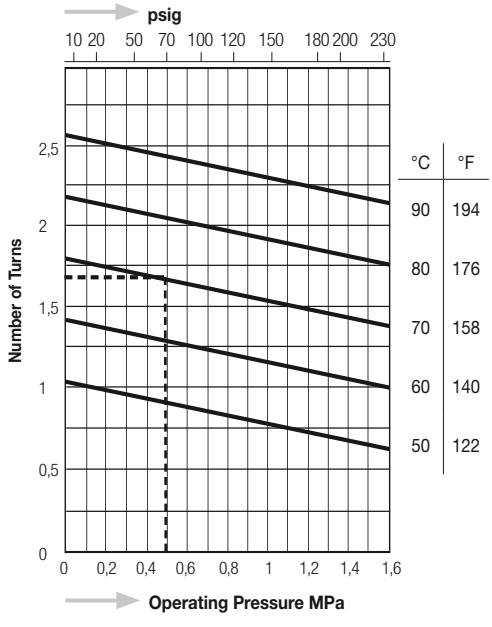
TB1N



Temperature Stroke Chart **TBC2/TBC2B-6**

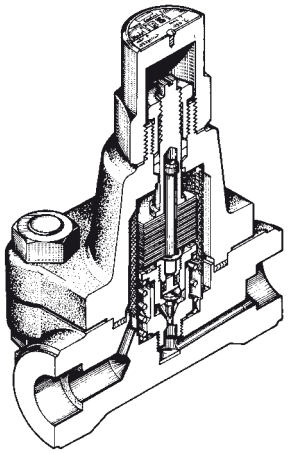


Temperature Stroke Chart **TB1N**



Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Adjustable Range		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
TBC2-6	Screwed Rc, NPT	¼", ⅜"	0,6	87	220	428	50 – 130	122 – 266	60	54	23	33	2.4	2.1	0.9	1.3	Stainless Steel SCS13A	0,33	0.73
TBC2B-6																			
TB1N	Screwed Rc, NPT	¼", ⅜"	1,6	230	350	662	50 – 90	122 – 194	70	–	–	38	2.8	–	–	1.5	Carbon Steel S25C	0,35	0.77

TB51, TB52



Basic Type

Flanged

Special face-to-face dimensions available.

* **Curve 1** shows the trap's maximum capacity when discharging cold condensate at a temperature of 20°C (68°F).

** **Curve 2** shows the trap's maximum capacity when discharging hot condensate at a temperature of 10°C (18°F) below the adjusted temperature of the trap.

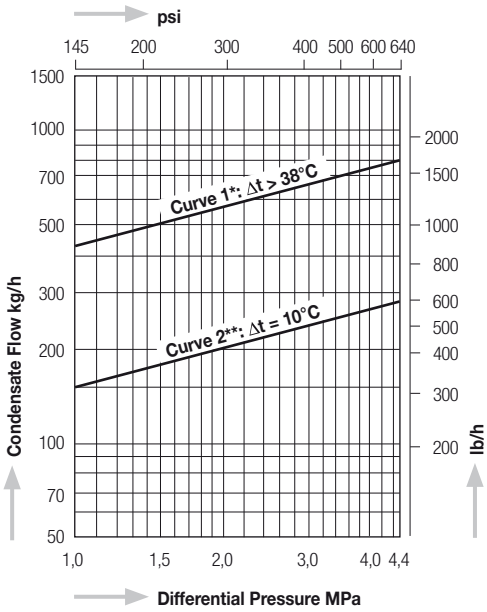
Standard factory setting:

TB51-45, TB52-45:
180°C at 2,1 MPa; 356°F at 290 psig

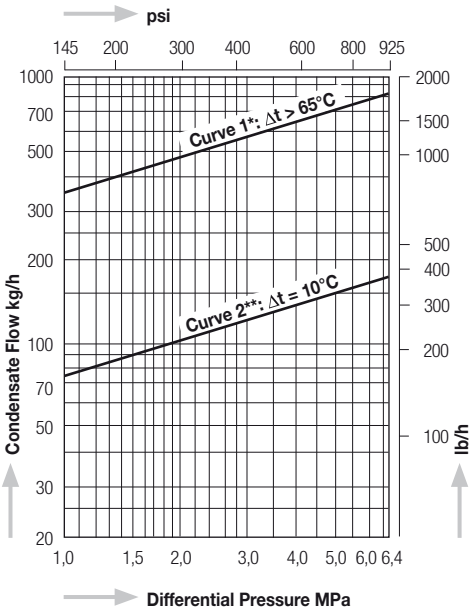
TB51-65, TB52-65:
220°C at 4,4 MPa; 428°F at 630 psig

The dashed line
shows the standard factory setting.

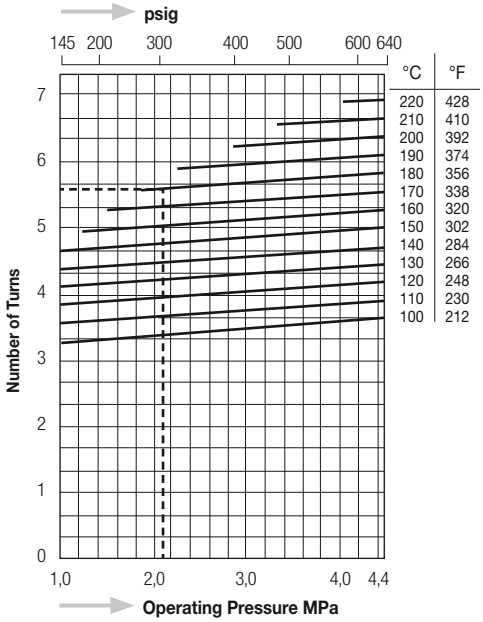
Capacity Charts TB51-45, TB52-45



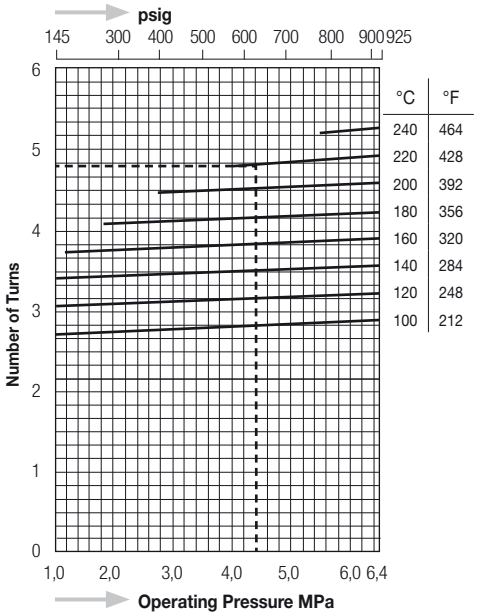
TB51-65, TB52-65



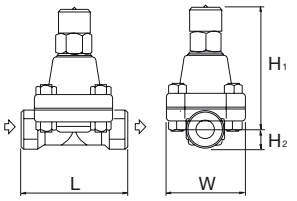
Temperature Stroke Charts TB51-45, TB52-45



TB51-65, TB52-65



Dimensions TB51, TB52



TB51F, TB52F

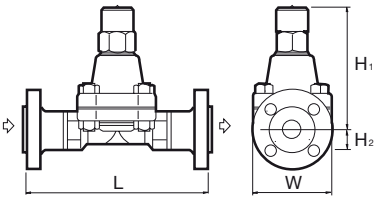
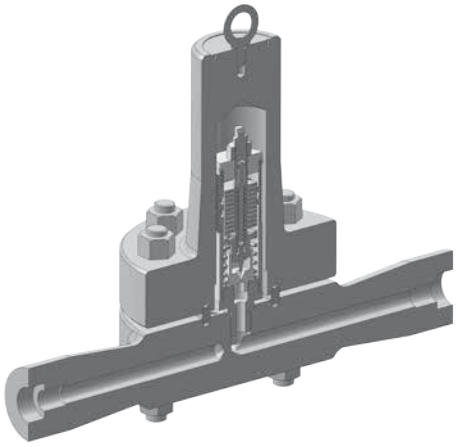


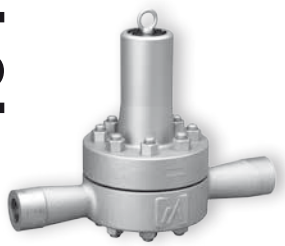
Table 1: Face-to-face dimensions / weights

Model	Size (in)	ASME 600 lb				DIN PN63 / PN100				JIS 63 K / ASME 900 lb			
		mm	in	kg	lb	mm	in	kg	lb	mm	in	kg	lb
TB51F TB52F	½ "	200	7.9	8,8	19.4	210	8.3	8,8	19.4	220	8.7	9,0	19.4
	¾ "	210	8.3	10,2	22.4	230	9.1	10,2	22.4	230	9.1	10,2	22.4
	1 "	240	9.4	11,2	24.6	230	9.1	11,0	23.3	240	9.4	11,2	24.6

Model		Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Adjustable Range		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
				MPa	psig	°C	°F	°C	°F	L	H1	H2	W	L	H1	H2	W		kg	lb
TB51 (TB52)	45	Screwed Rc, NPT	½" – 1"	4,4	640	425 (475)	800 (887)	100 – 220	212 – 428	130	156	25	100	5.1	6.1	1.0	3.9		5,0	11.1
	65			6,4	925			100 – 240	212 – 464											
TB51 (TB52)W	45	Socket Weld JIS, ASME, DIN	½" – 1"	4,4	640	425 (475)	800 (887)	100 – 220	212 – 428	130	156	25	100	5.1	6.1	1.0	3.9	Forged Steel A105	5,0	11.1
	65			6,4	925			100 – 240	212 – 464											
TB51 (TB52)F	45	Flanged JIS, ASME, DIN	½" – 1"	4,4	640	425 (475)	800 (887)	100 – 220	212 – 428	Table 1	156	25	100	Table 1	6.1	1.0	3.9	TB52: A182F22	Table 1	Table 1
	65			6,4	925			100 – 240	212 – 464											

TBH71, TBH72
TBH81, TBH82



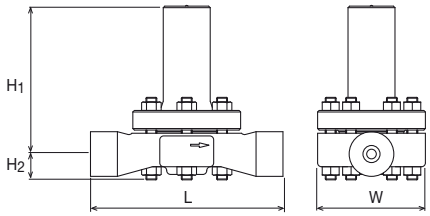


TBH72, TBH81, TBH82
Socket Weld

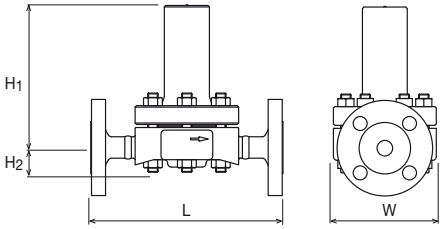
TBH71
Flanged

Dimensions

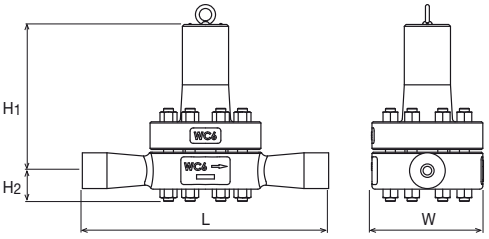
TBH71- …W
Socket Weld



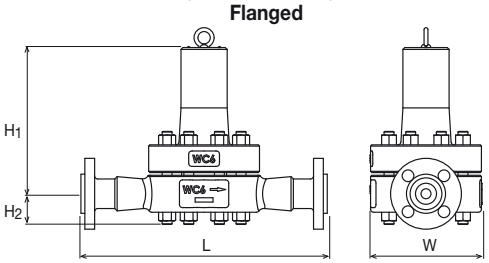
TBH71- …F
Flanged



TBH72- …W, TBH81- …W, TBH82- …W
Socket Weld



TBH72- …F, TBH81- …F, TBH82- …F
Flanged



Standard factory settings

Model	MPa	psig	Model	MPa	psig
TBH71-80	6,5 (210°C)	942 (410°F)	**TBH72-80**	6,5 (210°C)	942 (410°F)
TBH71-105	8,0 (230°C)	1160 (446°F)	**TBH72-105**	8,0 (230°C)	1160 (446°F)
TBH81-150	10,5 (250°C)	1522 (482°F)	**TBH82-150**	10,5 (250°C)	1522 (482°F)
TBH81-200	15,0 (270°C)	2175 (518°F)	**TBH82-200**	15,0 (270°C)	2175 (518°F)

Pressure shell design conditions

Model	PMA		TMA	
	MPa	psig	°C	°F
TBH71-80	11,8 (425°C)	1711 (800°F)	593 (1,3MPa)	1100 (188psig)
TBH71-105				
TBH72-80	25,0 (492°C)	3625 (918°F)	593 (3,7MPa)	1100 (536psig)
TBH72-105				
TBH81-150	25,0 (492°C)	3625 (918°F)	593 (3,7MPa)	1100 (536psig)
TBH81-200				
TBH82-150	25,0 (520°C)	3625 (968°F)	593 (5,9MPa)	1100 (856psig)
TBH82-200	25,0 (538°C)	3625 (1000°F)	593 (7,3MPa)	1100 (1059psig)

Model	Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Adjustable Range		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
TBH71-80W	Socket Weld JIS, ASME, DIN	½" – 1"	1,0 – 8,0	145 – 1160	470	878	100 – 260	212 – 500	250	195	33	140	9.8	7.7	1.3	5.5	Cast Steel A217WC6	13	28.6
TBH71-105W			1,0 – 10,5	145 – 1522			100 – 280	212 – 536										13	28.6
TBH81-150W			2,0 – 15,0	290 – 2175			100 – 300	212 – 572	400	268	50	180	15.7	10.6	2.0	7.1		29	63.8
TBH81-200W			2,0 – 20,0	290 – 2900			100 – 320	212 – 608										29	63.8
TBH71-80F	Flanged JIS, ASME, DIN	½" – 1"	1,0 – 8,0	145 – 1160	470	878	100 – 260	212 – 500	260	195	33	140	10.2	7.7	1.3	5.5	Cast Steel A217WC6	19*	41.8*
TBH71-105F			1,0 – 10,5	145 – 1522			100 – 280	212 – 536										19*	41.8*
TBH81-150F			2,0 – 15,0	290 – 2175			100 – 300	212 – 572	400	268	50	180	15.7	10.6	2.0	7.1		38*	83.6*
TBH81-200F			2,0 – 20,0	290 – 2900			100 – 320	212 – 608										38*	83.6*

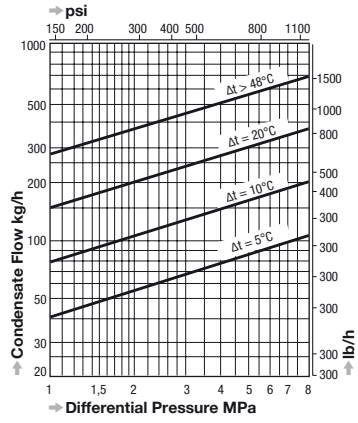
Model	Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Adjustable Range		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
TBH72-80W	Socket Weld JIS, ASME, DIN	½" – 1"	1,0 – 8,0	145 – 1160	550	1022	100 – 260	212 – 500	400	268	50	180	15.7	10.6	2.0	7.1	Cast Steel A217WC6	29	63.8
TBH72-105W			1,0 – 10,5	145 – 1522			100 – 280	212 – 536										29	63.8
TBH82-150W			2,0 – 15,0	290 – 2175			100 – 300	212 – 572		282	62	190		11.1	2.4	7.5	Cast Steel A217WC9	37	81.4
TBH82-200W			2,0 – 20,0	290 – 2900			100 – 320	212 – 608	465	310	75	235	18.3	12.2	3.0	9.3		68	149.6
TBH72-80F	Flanged JIS, ASME, DIN	½" – 1"	1,0 – 8,0	145 – 1160	550	1022	100 – 260	212 – 500	400	268	50	180	15.7	10.6	2.0	7.1	Cast Steel A217WC6	35*	77.0*
TBH72-105F			1,0 – 10,5	145 – 1522			100 – 280	212 – 536										38*	83.6*
TBH82-150F			2,0 – 15,0	290 – 2175			100 – 300	212 – 572		282	62	190		11.1	2.4	7.5	Cast Steel A217WC9	46*	101.2*
TBH82-200F			2,0 – 20,0	290 – 2900			100 – 320	212 – 608	465	310	75	235	18.3	12.2	3.0	9.3		76*	167.2*

*** The weight refers to 1" flanged type. Depending on the size and flange standard the weights may differ.**

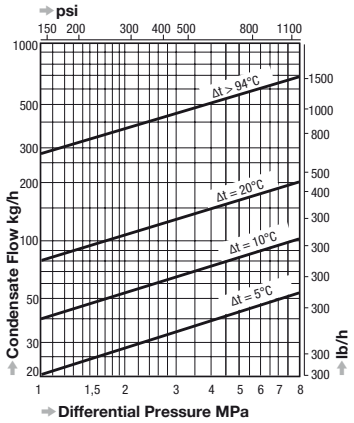
Bimetal Temperature Control Trap – High Pressure SERIES TB

Capacity Charts

TBH71 - 80

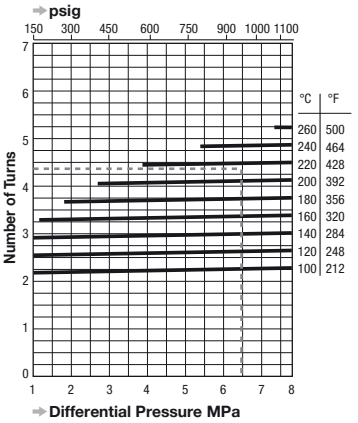


TBH72 - 80

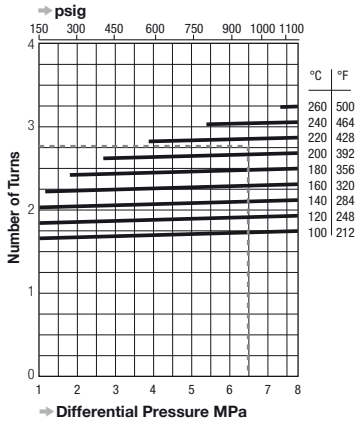


Temperature Stroke Charts

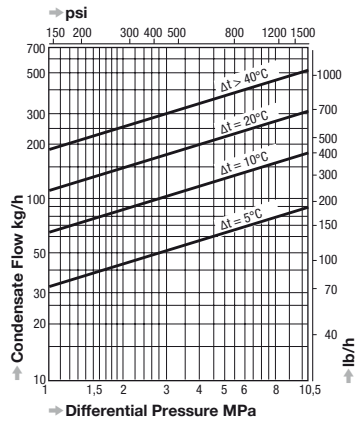
TBH71 - 80



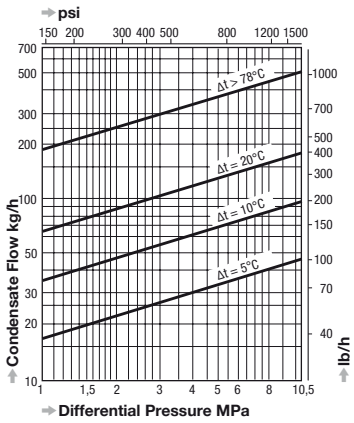
TBH72 - 80



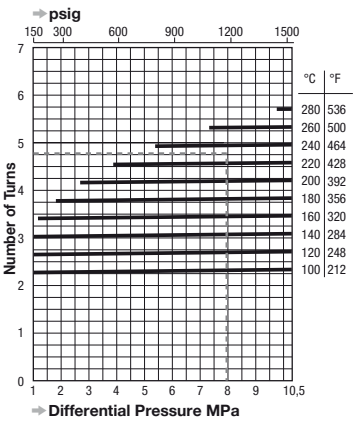
TBH71 - 105



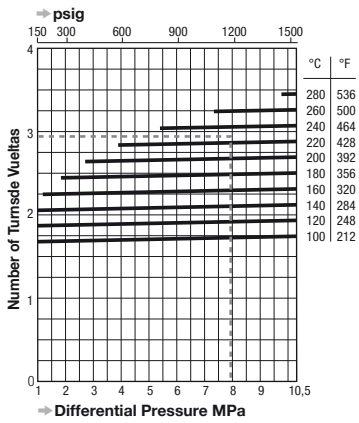
TBH72 - 105



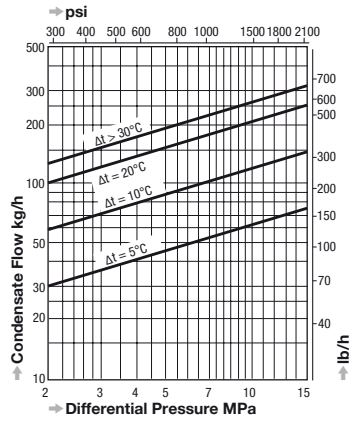
TBH71 - 105



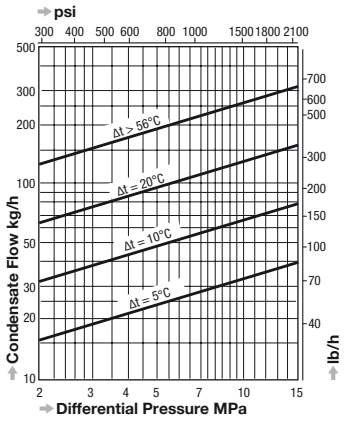
TBH72 - 105



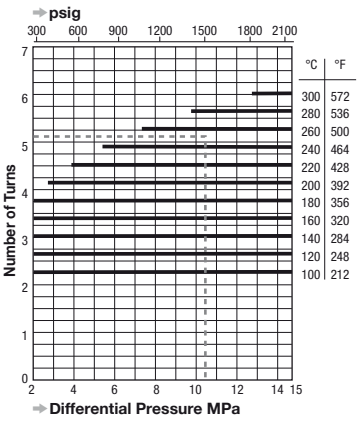
TBH81 - 150



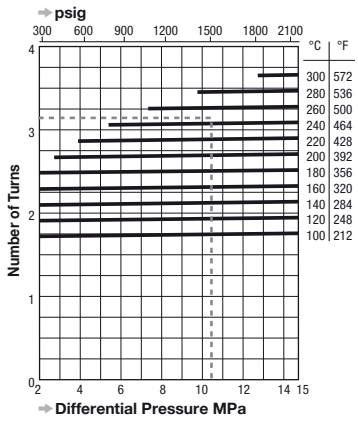
TBH82 - 150



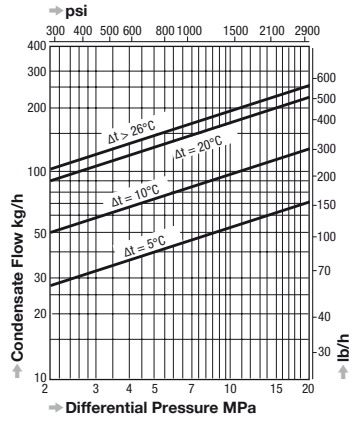
TBH81 - 150



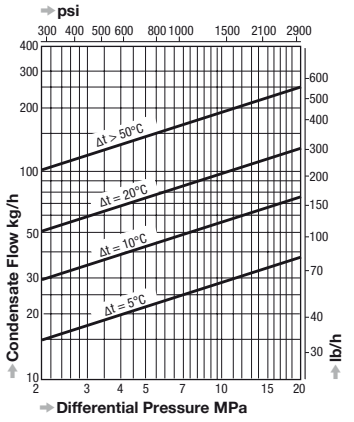
TBH82 - 150



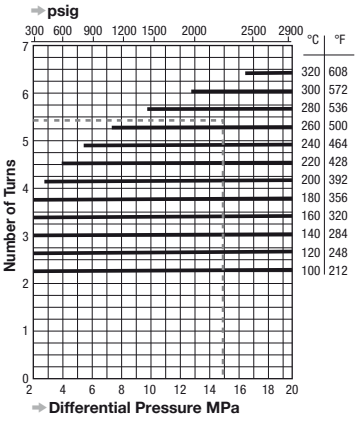
TBH81 - 200



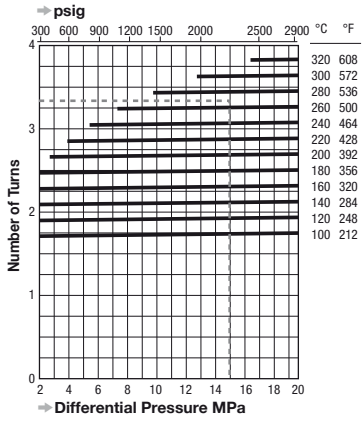
TBH82 - 200



TBH81 - 200



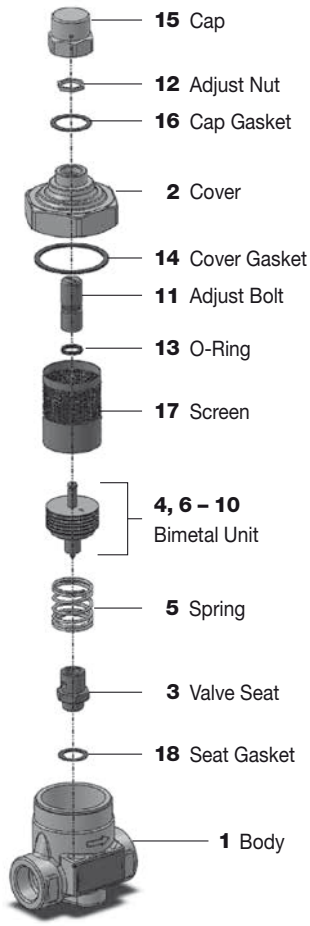
TBH82 - 200



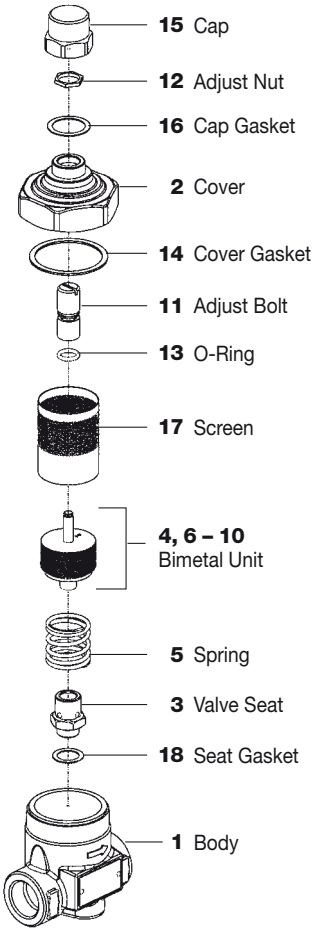
The dashed line shows the standard factory setting.

SERIES TB Spare Parts

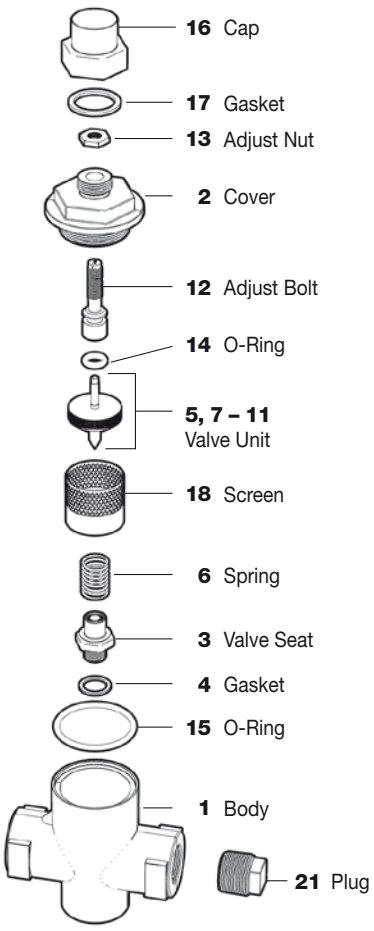
TB7N



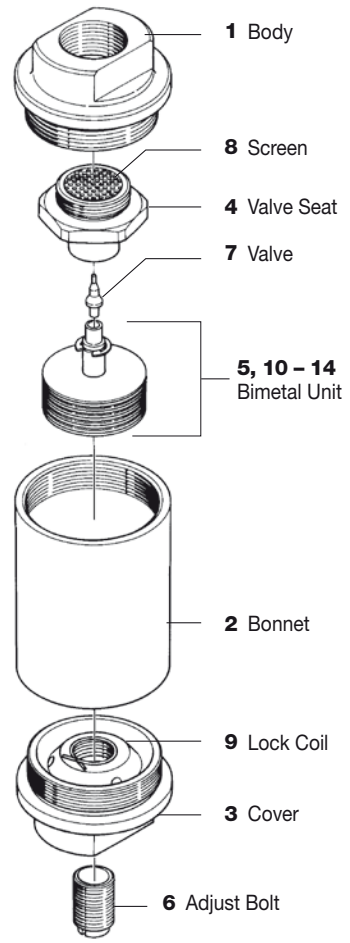
TB9N



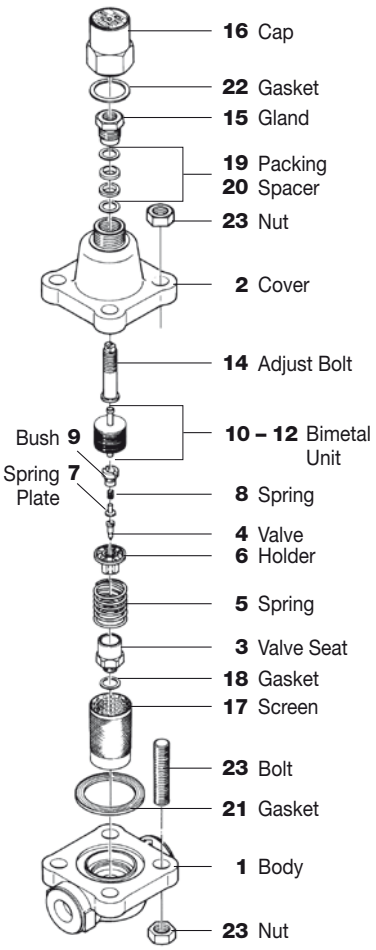
TBC2, TBC2B



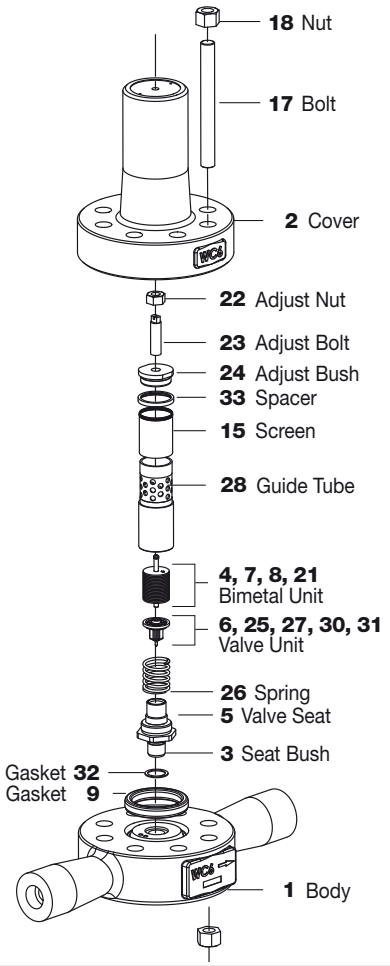
TB1N



TB51, TB52



TBH71, TBH72, TBH81, TBH82



Balanced Pressure Thermostatic Steam Traps

SERIES D

Balanced Pressure Thermostatic Steam Traps are equipped with a capsule element, which controls the discharge of condensate depending on the temperature. The capsule contains a special liquid, whose saturation temperature at a given pressure is always lower than that of the water. It ensures a very accurate functioning of the steam trap and is self-adjusting.

The discharge characteristic follows the saturation curve independent from pressure changes and the condensate load.

Series D MIYAWAKI steam traps can be delivered with 3 different capsule types:

- **Types H & C** discharge hot condensate at approximately 5°C (9°F) below saturation temperature
- **Type L** discharges hot condensate at approximately 15°C (27°F) below saturation temperature

Types

DC1, DV1, DL1, DX1 with stainless steel body and internals

DF1 with forged steel body and stainless steel internals

Features

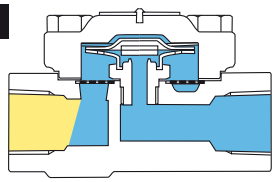
- Excellent air venting characteristics at start-up and during operation
- Insensitive to waterhammer
- The operation will not be influenced by back pressure
- At time of non-operation self-draining
- No steam loss throughout its operating range
- All traps equipped with integral strainers
- Can be installed both horizontally and vertically
- Easy in-line inspection and maintenance
- Lightweight, compact design

Suitable for **light to medium condensate loads:** steam tracing, steam main drips, small heat exchangers, unit heaters, steam heating coils and many other applications in the petrochemical, chemical, textile, food, pharmaceutical and other industries.

Operating principle

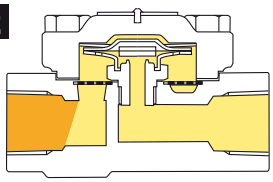
cold condensate | hot condensate | steam

1



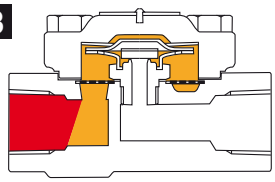
Upon start-up in the presence of cold condensate, the capsule element is contracted and the valve plate has moved away from the seat. The wide open valve discharges condensate and air rapidly.

2



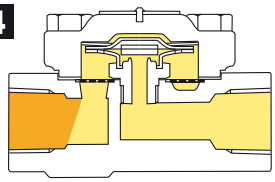
As the temperature inside the trap increases, the capsule element will start to expand, moving the valve plate toward the seat.

3



Just before the condensate reaches saturation temperature, the valve plate will close the seat completely. Steam can not enter the trap, ensuring zero steam loss.

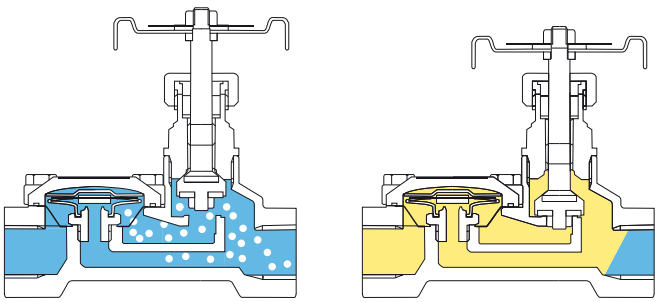
4



As the temperature inside the trap decreases, the capsule element moves away from the seat and the condensate will be discharged. During normal operation steps 3 and 4 will repeat continuously.

Operating principle of DV1 when using the bypass valve

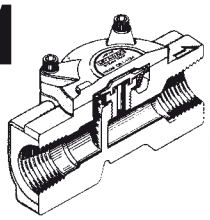
When the handle is turned in the direction indicated by the BLOW arrow on the nameplate (counterclockwise), the bypass valve will open, a bypass circuit will be formed inside the trap, and a large volume of air and condensate can be discharged quickly. Scale that has accumulated in the screen can also be blown out.



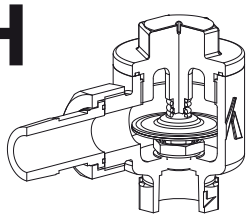
When the bypass valve is closed, the type DV1 will operate as a normal steam trap (see above operating principle).

SERIES D Balanced Pressure Thermostatic Steam Trap

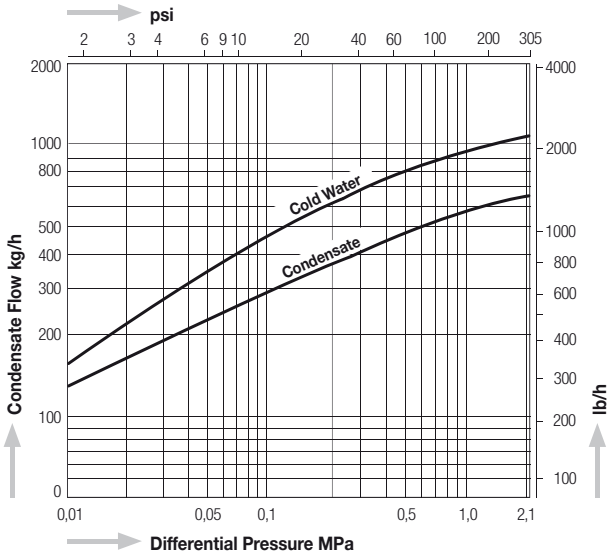
DC1



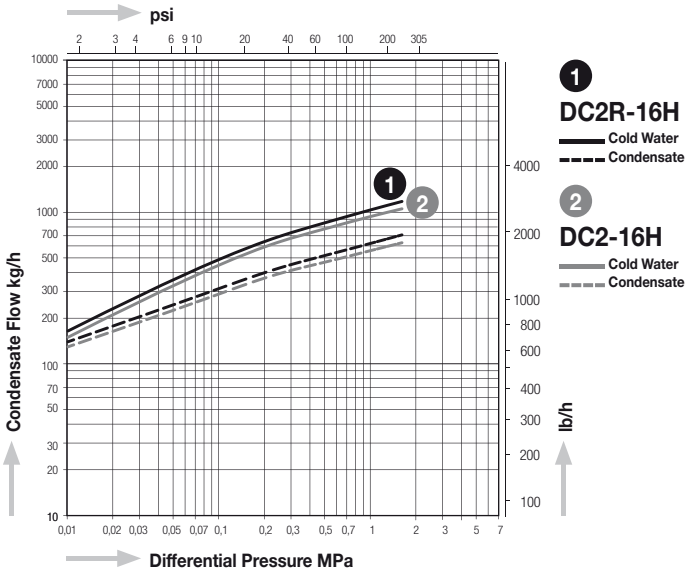
DC2R-16H
DC2-16H



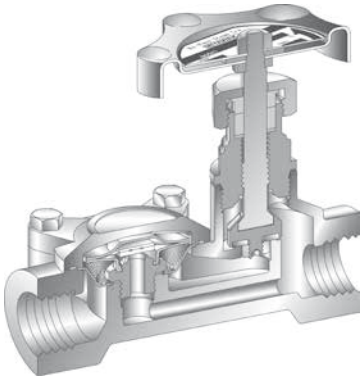
Capacity Chart **DC1**



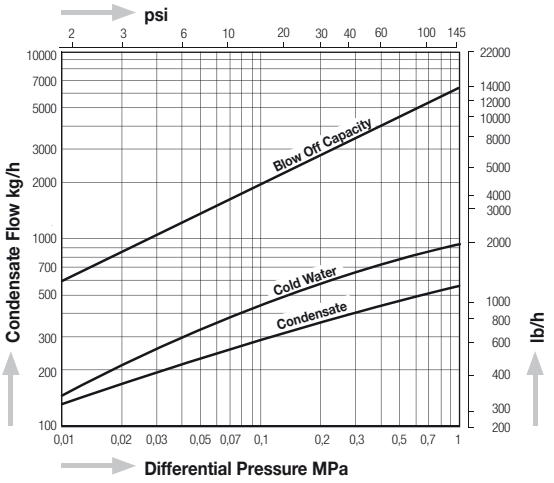
Capacity Chart



DV with Bypass Valve

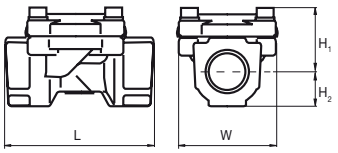


Capacity Chart **DV1**

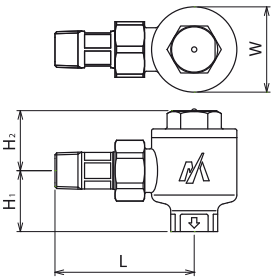


Dimensions

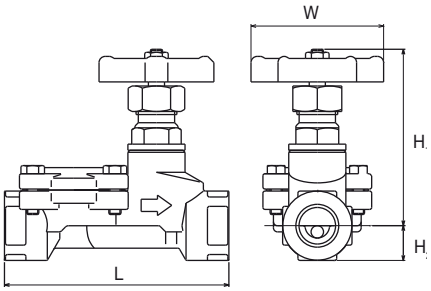
DC1



DC2R-16H, DC2-16H

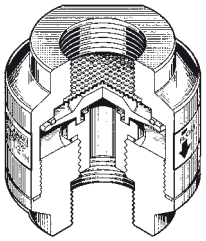


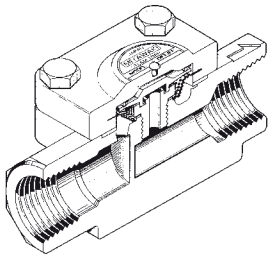
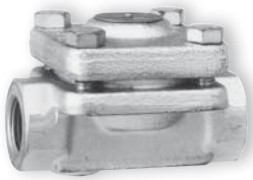
DV1



Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
DC1-21H **DC1-21L**	Screwed Rc, NPT	¼", 3/8"	2,1	305	220	428	65	28	11	53	2.6	1.1	0.4	2.1	Stainless Steel SCS13A	0,4	0.9
		½", ¾"					75	30	17		3.0	1.2	0.7			0,5	1.1
		1"					80	33	21		3.2	1.3	1.4			0,5	1.1
DC2R-16H **DC2-16H**	Inlet: R Outlet: Rc, NPT	½"	1,6	230	220	428	80	35	35	49	3.1	1.4	1.4	1.9		0,7	1.5
DV1-10	Screwed Rc, NPT	½", ¾"	1,0	145	185	365	110	88	17	65	4.3	3.5	0.7	2.6		0,9	1.9

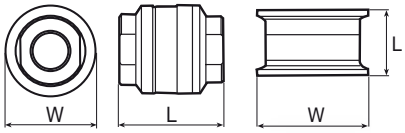
DL1 DX1 DF1



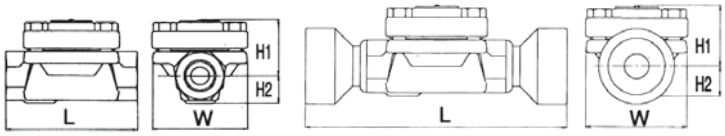
Dimensions

DL1 **DX1**

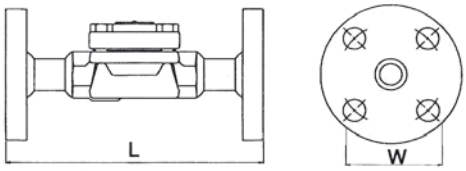


DF1

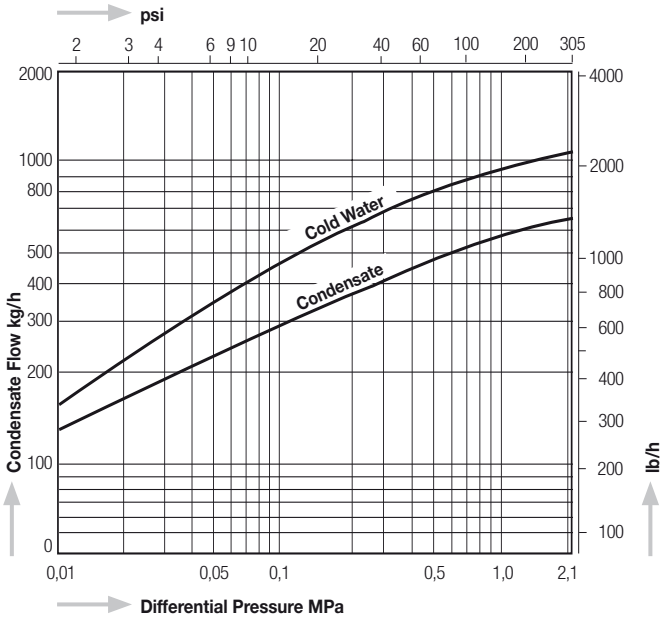
Screwed **Socket Weld**



Flanged



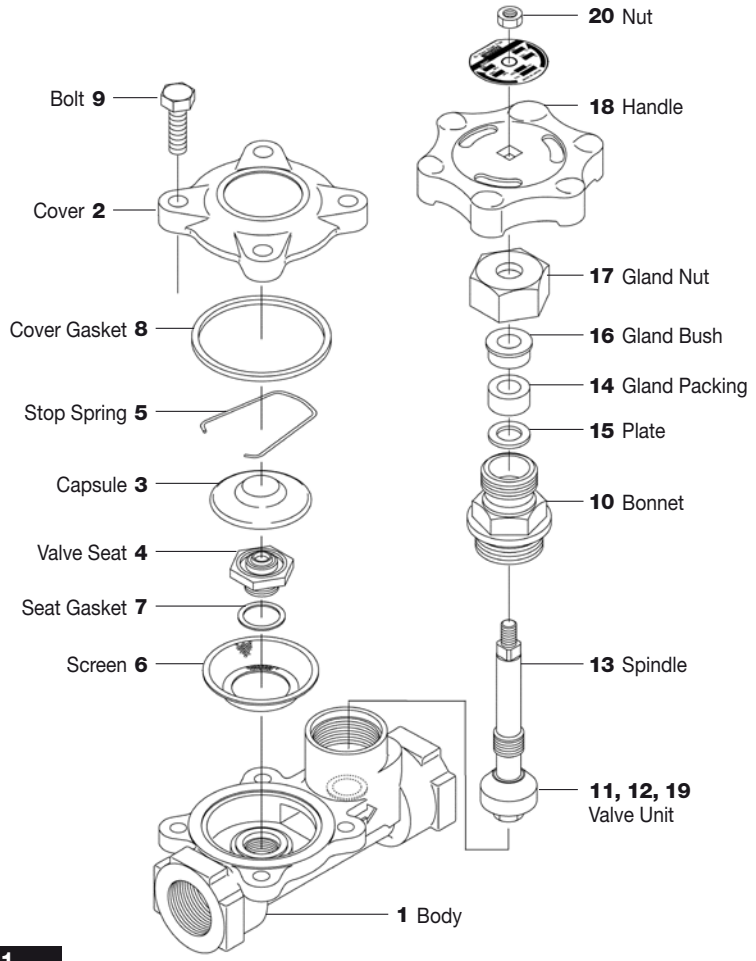
Capacity Charts **DL1, DX1, DF1**



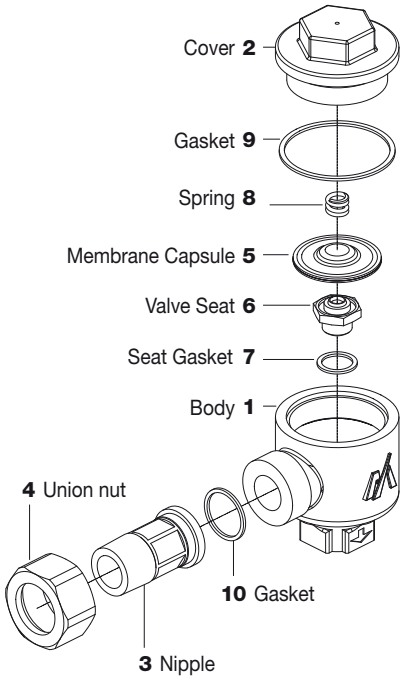
Special face-to-face dimensions available.

Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
DL1-21	Screwed Rc, NPT	1/4 ¨	2,1	305	220	428	60			48	2.4			1.9	Stainless Steel SCS13	0,7	1.5
		3/8 ¨															
		1/2 ¨															
		3/4 ¨															
		1 ¨															
DL1-10	Screwed Rc, NPT	1/4 ¨	1,0	145	220	428	60			48	2.4			1.9		0,7	1.5
		3/8 ¨															
		1/2 ¨															
		3/4 ¨															
		1 ¨															
DX1-5 (DX1R-5)	Tri-Clamp	38 mm	0,5	72.5	160	320	30			51	1.2			2.0	Stainless Steel SUS316	0,2	0.44
DF1-21	Screwed Rc, NPT	1/2 ¨	2,1	305	235	455	85	36	18	62	3.4	1.4	0.7	2.4	Forged Steel A105	1,0	2.2
		3/4 ¨					100	40	23		3.9	1.6	0.9			1,3	2.9
		1 ¨															
DF1-21W	Socket Weld JIS, ASME, DIN	1/2 ¨					160	36	18	62	6.3	1.4	0.7	2.4		1,4	3.1
		3/4 ¨															
		1 ¨															
DF1-21F	Flanged DIN PN40, ASME 150, 300 lb	1/2 ¨					150	36	18	62	5.9	1.4	0.7	2.4		2,1	4.6
		3/4 ¨						40	23			1.6	0.9			3,3	7.3
		1 ¨					160				6.3					4,0	8.8

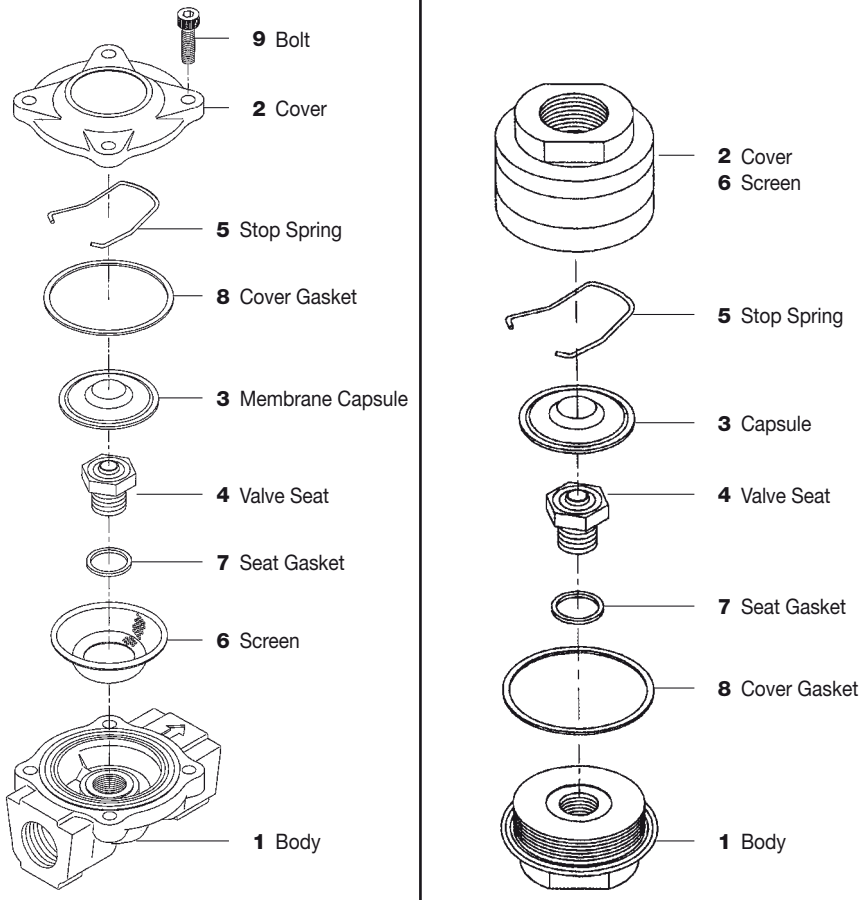
DV1



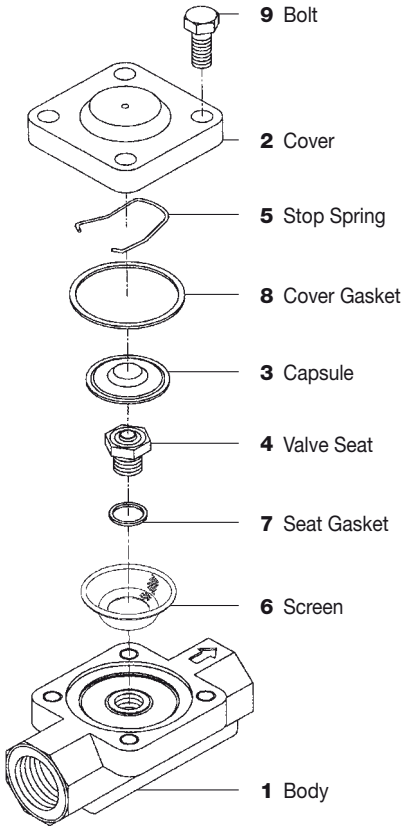
DC2



DC1



DF1



Thermodynamic Disc Traps

SERIES S

Thermodynamic steam traps operate on the basis of the Bernoulli principle, depending on the relationship between the velocity and the pressure exerted by the condensate and steam inside the steam trap.
They have only one moving part – the disc.
Due to their compact design and cost effectiveness thermodynamic steam traps are widely used in applications where the condensate must be removed immediately from steam lines and steam equipment. They discharge the condensate near the saturation temperature. The traps may operate up to a back pressure of 80% of the inlet pressure, but for smooth operation it is recommended that the back pressure does not exceed 50% of the inlet pressure. Thermodynamic steam traps discharge the condensate intermittently.
All steam traps are equipped with a hardened stainless steel disc and seat. After the lapping process all disc surfaces are controlled individually before releasing them for use in steam traps. These features and very high and severe quality standards for the whole production process give MIYAWAKI's thermodynamic steam traps a long and reliable service life.

Types

S31N	Ductile Cast Iron Steam Traps with replaceable internals
SC,SF	Cast Iron Steam Traps for high capacity
SC31	Stainless steel steam traps with replaceable internals
SD1, SU2N, SU2H	Stainless steel steam traps for low to high pressure applications
S55N, S55H, S61N, S62N	Forged steel steam traps for high pressure applications
SV	Steam Traps with inbuilt bypass
SL3	Compact, very small trap for low capacity applications

Features

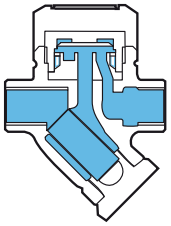
- Immediate discharge of condensate
- Insensitive to waterhammer, superheated steam and freezing
- Most types contain a bimetal ring which improves the ability of the trap to discharge air and cold condensate quickly at start-up and prevents air locking during times of operation
- Can be installed in any position
- In case of danger of air locking special discs available
- All traps equipped with additional cover for reduced frequency of cycling and energy savings
- All traps with inbuilt strainers (except SL3)
- Easy maintenance

Suitable for

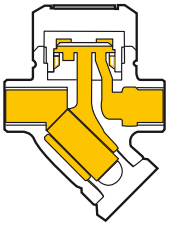
light to medium condensate loads: steam tracing, steam main drips, small heat exchangers, unit heaters, sterilizers and many other applications in the petrochemical, chemical, textile, food, pharmaceutical and further industries. **Series SV Thermodynamic steam traps with inbuilt bypass** are designed for special applications in the food, pharmaceutical or other industries or for laundry applications where costs and space must be saved.

Operating principle

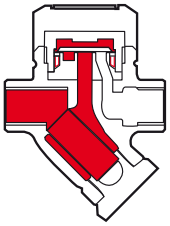
cold condensate hot condensate steam



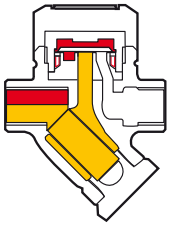
1 At the time of start up the pressure of the incoming cold condensate and air raise the disc and water and air are discharged quickly.



2 When hot condensate flows into the trap, the trap is still open and the hot condensate can be discharged quickly.

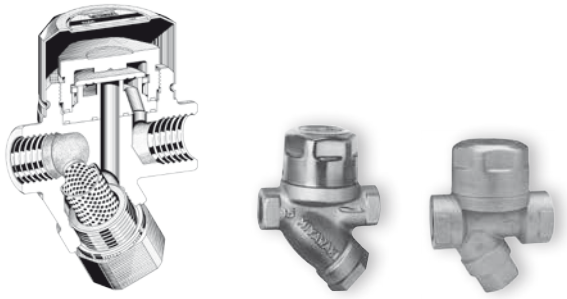


3 After hot condensate flows into the trap, steam enters it. As the velocity of the fluid increases, the pressure under the seat exerted by the steam decreases. At the same time the pressure in the pressure chamber above the disc increases. The disc is pressed down and closes.

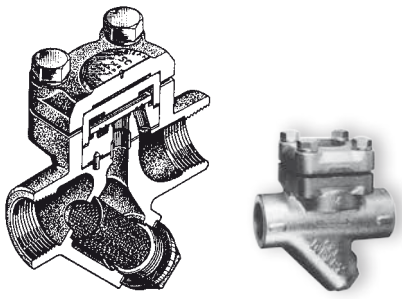


4 While hot condensate flows into the trap, the trap remains closed for a certain period, as far as the steam inside the pressure chamber does not condense. The more condensate flows into the trap, the more the temperature cools down. The steam inside the pressure chamber also cools down and condenses. As a result, the pressure of the incoming condensate raises the disc and condensate is discharged. Cycles 2, 3 and 4 repeat.

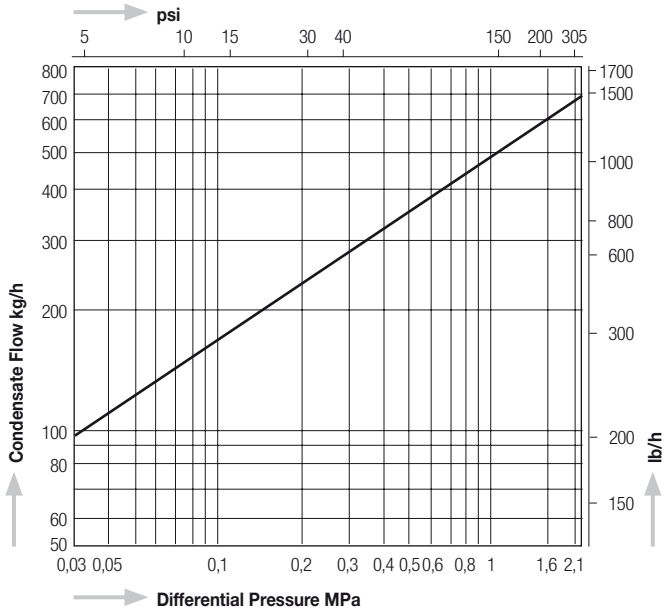
S31N, SC31



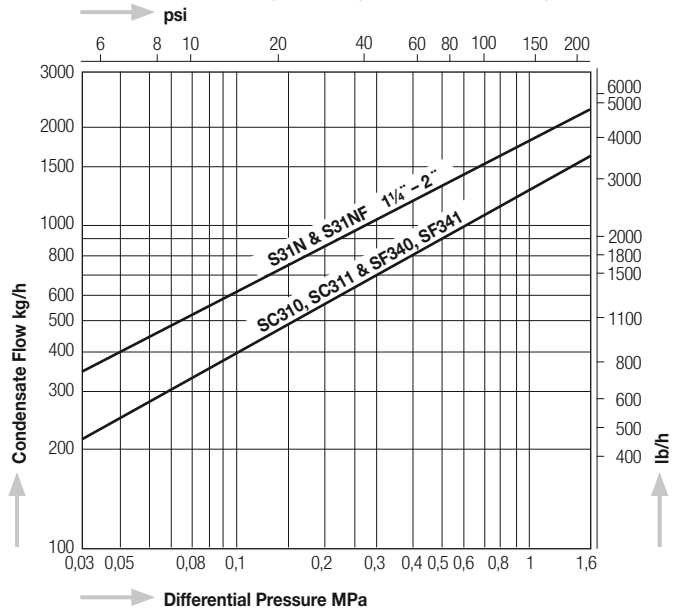
SC, SF



Capacity Chart
SC31/S31N & S31NF ½¨ – 1¨

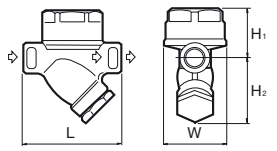


Capacity Chart
S31N & S31NF 1¼¨ – 2¨; SC310, SC311 & SF340, SF341

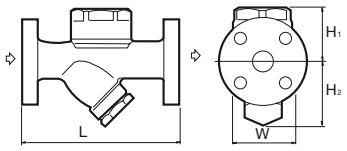


Dimensions

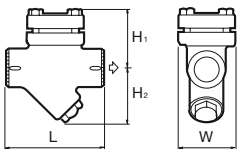
S31N/SC31 1/2¨ – 1¨



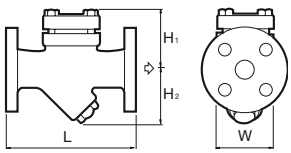
S31NF 1/2¨– 1¨



S31N 1¼¨ – 2¨
SC310, SC311

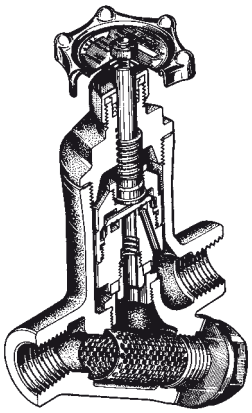


S31NF 1¼¨ – 2¨
SF340, SF341



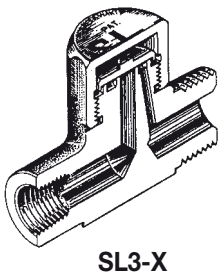
Model	Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H1	H2	W	L	H1	H2	W		kg	lb
SC31	Screwed Rc, G, NPT	½¨	0,03 – 2,1	4.4 – 305	220	428	78	55	59	61	3.1	2.2	2.3	2.4	Stainless Steel SCS14	1,0	2.2
		¾¨					90	61			3.5	2.4				1,3	2.9
		1¨					95				3.7					1,2	2.6
S31N	Screwed Rc, NPT	½¨	0,03 – 1,6	4.4 – 230	220	428	90	55	65	60	3.5	2.2	2.6	2.4	Ductile Cast Iron FCD450	1,1	2.4
		¾¨						60				2.4				1,2	2.6
		1¨					95				3.7					1,3	2.9
		1¼¨					180	104	100	106	7.1	4.1	3.9	4.2	Cast Iron FC250	8,0	17.6
		1½¨														8,7	19.1
		2¨						111				4.4				9,3	20.5
S31NF	Flanged JIS, ASME, DIN	½¨					140	55	65	60	5.5	2.2	2.6	2.4	Ductile Cast Iron FCD450	2,5	5.5
		¾¨					150	60			5.9	2.4				3,0	6.6
		1¨					160				6.3					4,2	9.2
		1¼¨					240	104	100	106	9.5	4.1	3.9	4.2	Cast Iron FC250	12,0	26.4
		1½¨														13,5	29.7
		2¨														14,5	31.9
SC - 310	Screwed Rc, NPT	¾¨					180	89	81	96	7.1	3.5	3.2	3.8	Cast Iron FC250	6,0	13.2
311		1¨															
SF - 340	Flanged JIS, ASME, DIN	¾¨					240				9.5					10,0	22.0
341		1¨															

SV

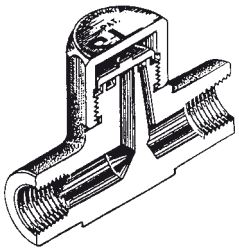


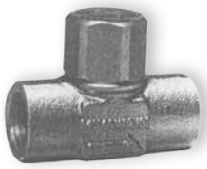
SL

SL3-A



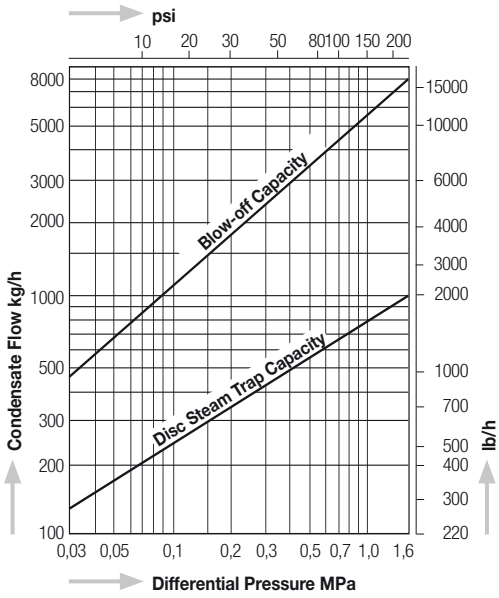
SL3-X



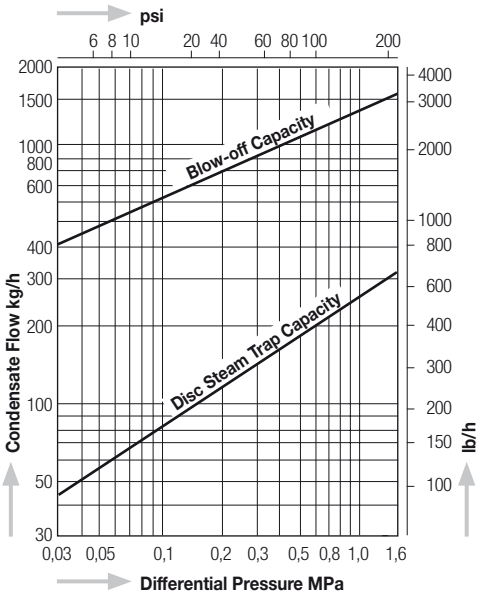


Capacity Charts

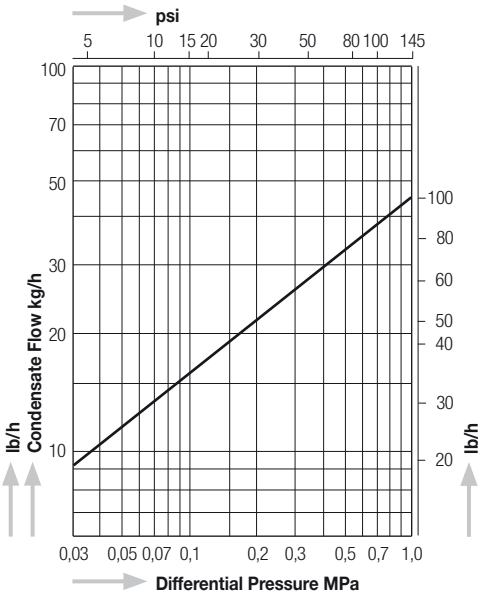
SV-N



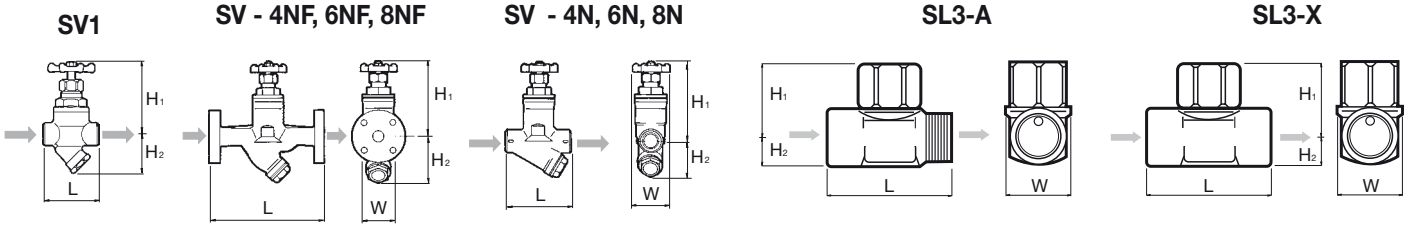
SV1



SL3

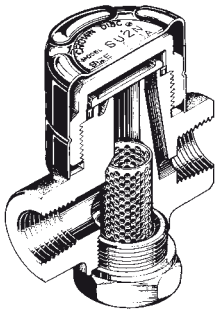


Dimensions



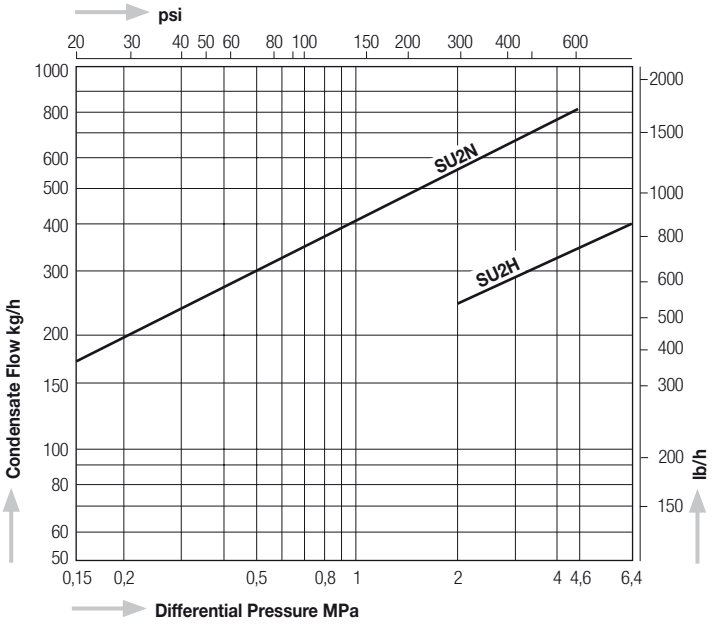
Model		Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
				MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
SV1		Screwed Rc, NPT	⅜¨, ½¨	0,03 – 1,6	4.4 – 230	220	428	75	105	53	65	3.0	4.1	2.1	2.6	Cast Steel A216WCB	1,0	2.2
			¾¨, 1¨						107				4.2				1,2	2.6
SV -	**4N**	Screwed Rc, NPT	½¨					110	155	60	65	4.3	6.1	2.4	2.6	Cast Iron FC250	2,4	5.3
	6N		¾¨					120		65		4.7		2.6			2,5	5.5
	8N		1¨							70				2.8			2,7	5.9
	4NF	Flanged JIS, ASME, DIN	½¨					220	150	90	65	8.7	5.9	3.5	2.6		4,1	9.0
	6NF		¾¨														4,7	10.3
	8NF		1¨					230				9.1					5,2	11.5
SL3-A		Screwed Rc, NPT	¼¨	0,03 – 1,0	4.4 – 145	400	752	40	22	8	19	1.6	0.9	0.3	0.7	Stainless Steel SUS416	0,06	0.13
SL3-X		Screwed Rc, NPT	¼¨	0,03 – 1,0	4.4 – 145	400	752	40	22	8	19	1.6	0.9	0.3	0.7		0,06	0.13

SU2N, SU2H

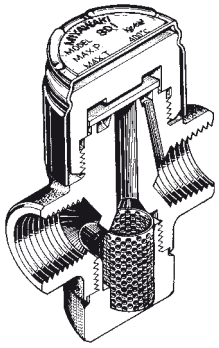


Special face-to-face dimensions available.

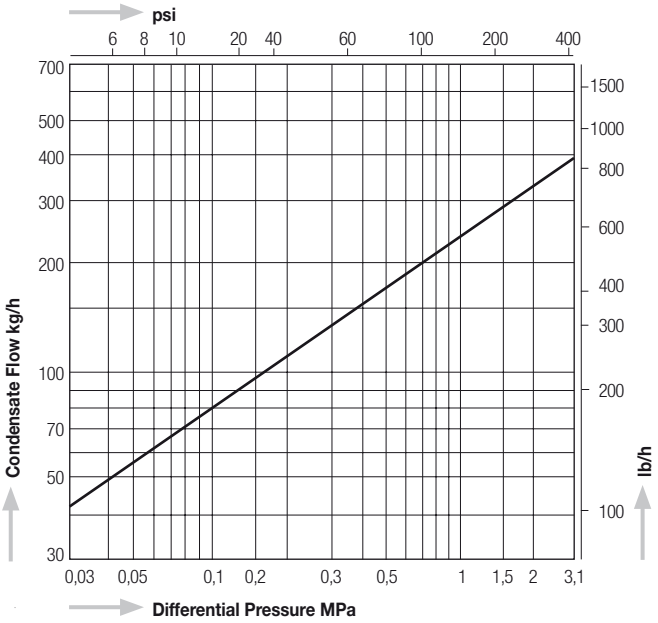
Capacity Chart **SU2N, SU2H**



SD1

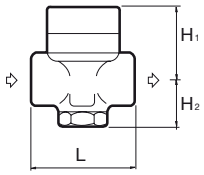


Capacity Chart **SD1**

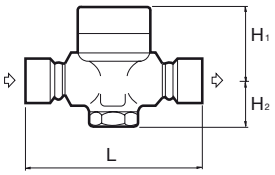


Dimensions

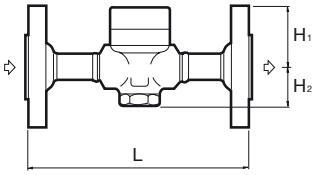
SU2N, SU2H



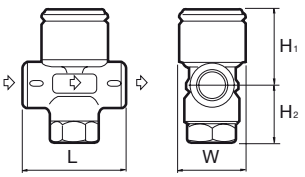
SU2NW, SU2HW



SU2NF, SU2HF

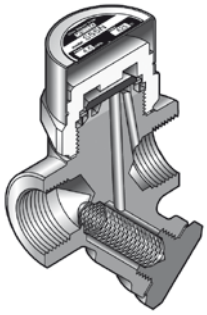


SD1



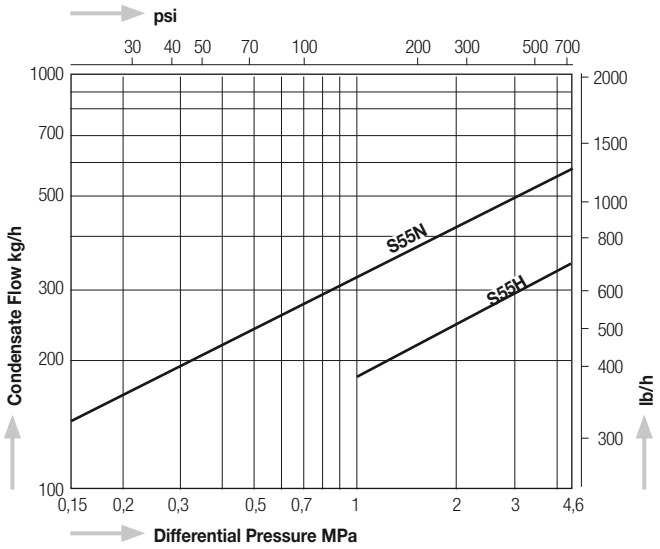
Model	Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
SU2N (SU2H)	Screwed Rc, NPT	½¨	0,15 – 4,6 (2,0 – 6,4)	22 – 667 (290 – 928)	425	800	70	47	32	53	2.8	1.9	1.3	2.1	Stainless Steel SUS420J2	0,8	1.8
		¾¨															
		1¨					75	51			3.0	2.0				0,9	2.0
SU2NW (SU2HW)	Socket Weld ASME, DIN	½¨					140	47	32	53	5.5	1.9	1.3	2.1		1,0	2.2
		¾¨														1,1	2.4
		1¨														1,3	2.9
SU2NF (SU2HF)	Flanged JIS, ASME, DIN	½¨					205	47	32	53	8.1	1.9	1.3	2.1	Stainless Steel SUS420J2	2,7	5.9
		¾¨														3,7	8.1
		1¨														4,3	9.5
	Flanged DIN PN40	½¨					150	47	32	53	5.9	1.9	1.3	2.1		2,6	5.7
		¾¨														3,3	7.3
		1¨					160				6.3					3,8	8.4
SD1	Screwed Rc, NPT	¼¨	0,03 – 3,1	4.4 – 450	400	752	52	39	25	34	2.0	1.5	1.0	1.3	Stainless Steel SUS420J2	0,3	0.7
		⅜¨															
		½¨					60	41	23		2.4	1.6	0.9				

S55N, S55H

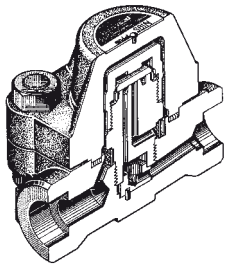


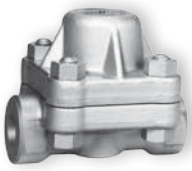
Special face-to-face dimensions available.

Capacity Chart **S55N, S55H**



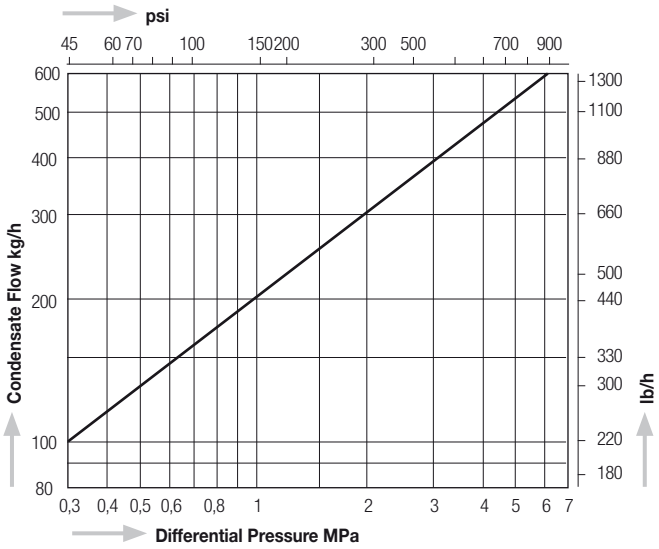
S61N, S62N



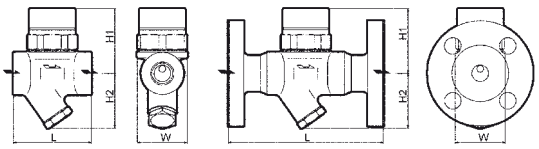


Special face-to-face dimensions available.

Capacity Chart **S61N, S62N**



Dimensions **S55N, S55H S55NF, S55HF**



S61N, S62N

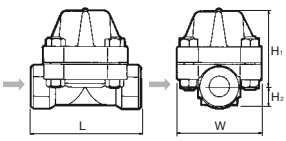


Table 1: Dimensions L and Weight

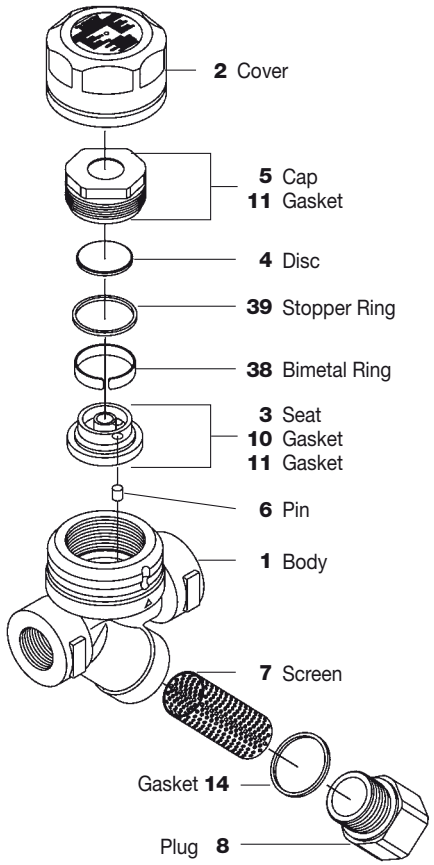
Model	Size (in)	ASME Class 600		JIS 63 K Class 900		DIN PN63, PN100		Weight	
		mm	in	mm	in	mm	in	kg	lb
S61NF S62NF	1/2 "	200	7.9	220	8.7	210	8.3	9,2	20.2
	3/4 "	210	8.3	230	9.1	230	9.1	10,5	23.1
	1 "	240	9.5	240	9.4	230	9.1	11,2	24.6

Model	Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
S55N (S55H)	Screwed Rc, NPT	1/2"	0,15 – 4,6 (1,0 – 4,6)	22 – 667 (145 – 667)	425	800	70	59	50	45	2.8	2.3	2.0	1.8	Forged Steel A105	0,8	1.8
		3/4"														0,8	1.8
		1"					75	63	54		3.0	2.5	2.1			1,2	2.6
S55NF (S55HF)	Flanged* JIS, ASME, DIN	1/2"					140	59	50	45	5.5	2.3	2.0	1.8		2,9	6.4
		3/4"					165				6.5					3,8	8.4
		1"					175				6.9					5,3	11.7
S55NW (S55HW)	Socket Weld ASME, DIN	1/2"					70	59	50	45	2.8	2.3	2.0	1.8		0,8	1.8
		3/4"														0,8	1.8
		1"					75	63	54		3.0	2.5	2.1			1,2	2.6
S61N (S62N)	Screwed Rc, NPT	1/2"	0,30 – 6,4	44 – 930	425 (S62N: 475)	800 (S62N: 887)	130	90	25	100	5.1	3.5	1.0	3.9	Forged Steel A105 (S62N: A182F22)	5,0	11.0
		3/4"															
		1"															
S61NF (S62NF)	Flanged JIS, ASME, DIN	1/2"					Table 1	90	25	100	Table 1	3.5	1.0	3.9		Table 1	Table 1
		3/4"															
		1"															
S61NW (S62NW)	Socket Weld ASME, DIN	1/2"					130	90	25	100	5.1	3.5	1.0	3.9		5,0	11.0
		3/4"															
		1"															

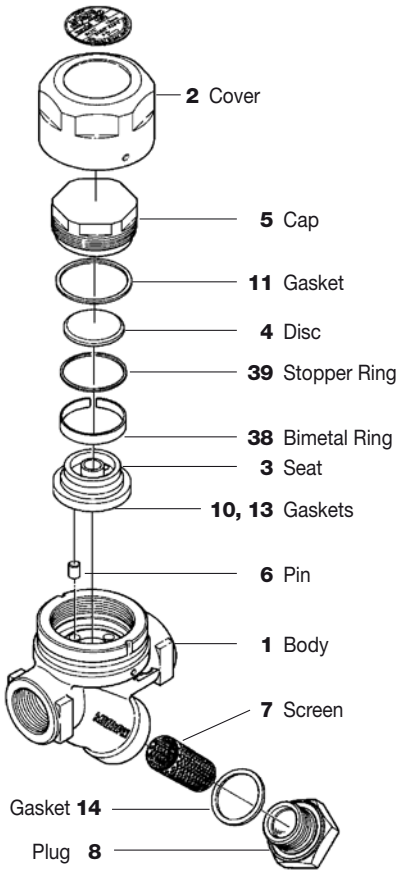
***DIN – Face-to-face dimensions also available.**

SERIES S Spare Parts

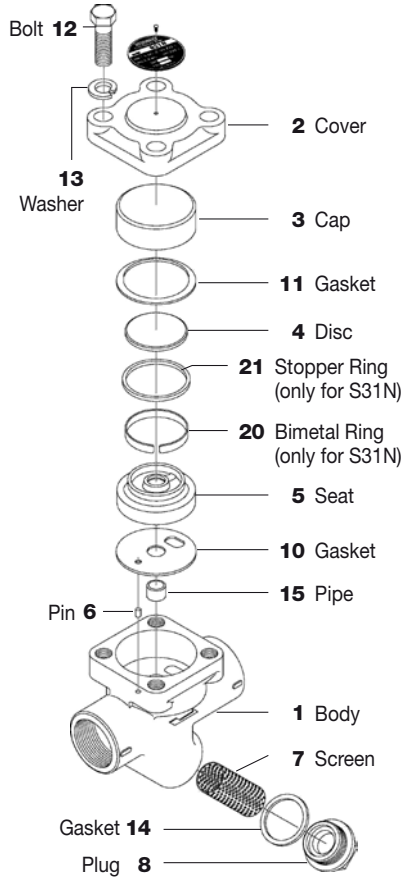
SC31



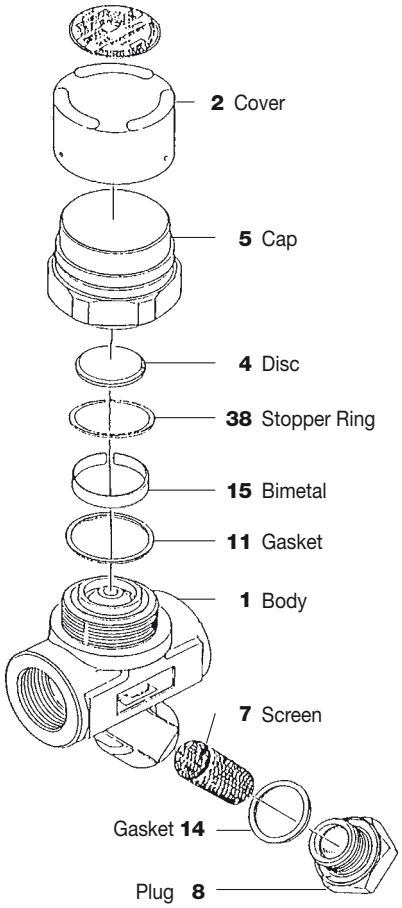
S31N (1/2"–1")



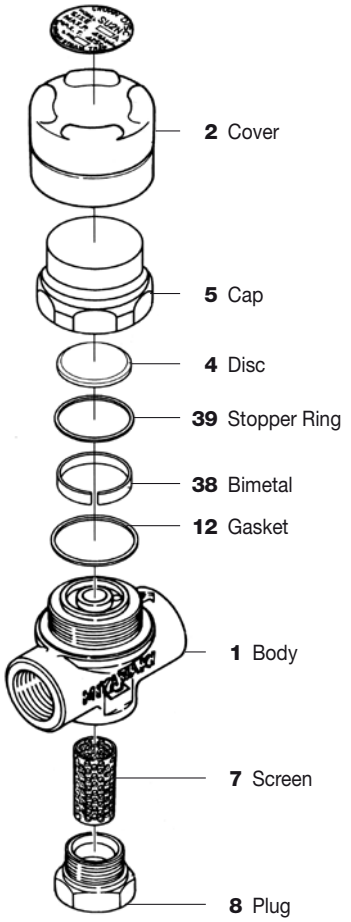
S31N (1 1/4"–2"), SC, SF (3/4"–1")



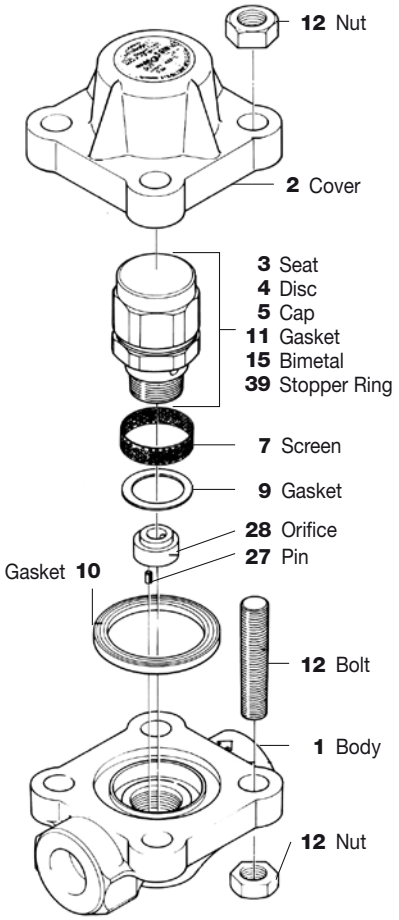
S55N/S55H



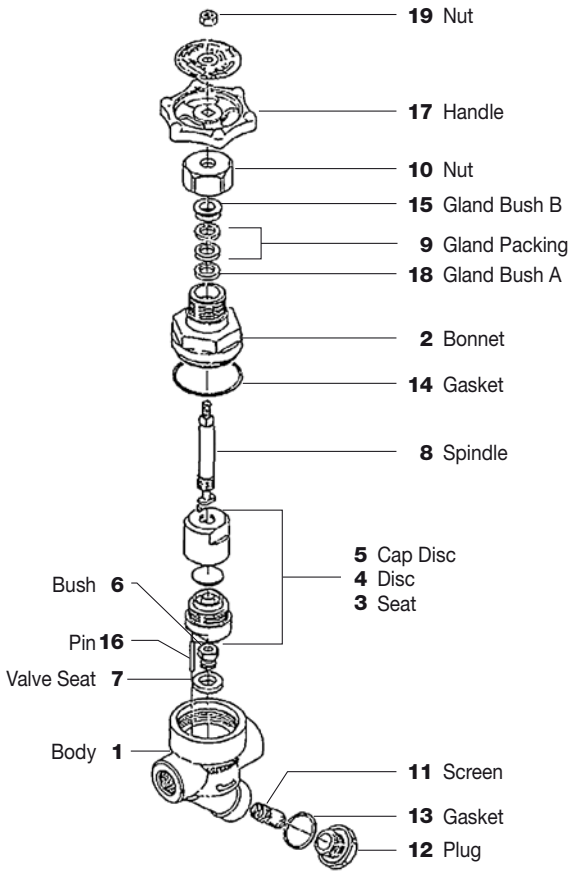
SU2N/SU2H



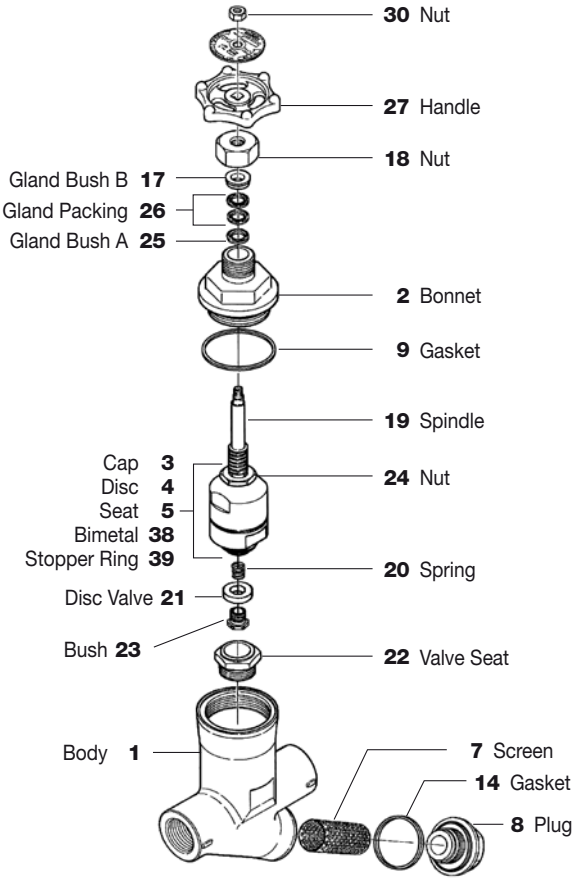
S61N/S62N



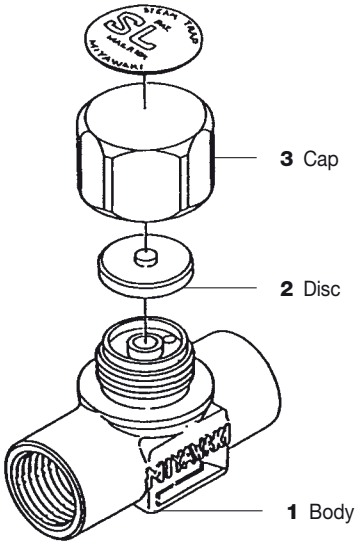
SV1



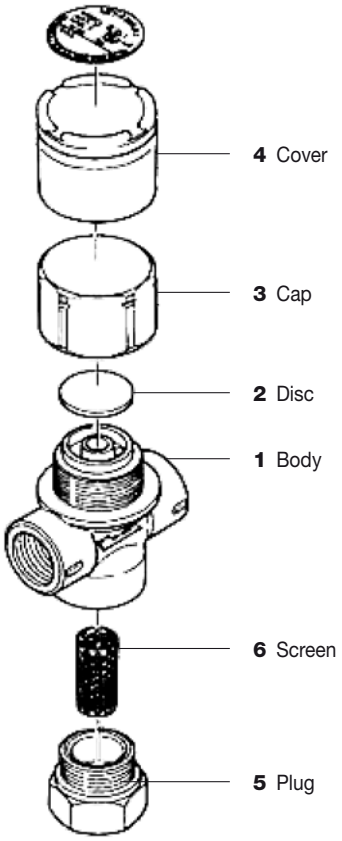
SV-N



SL3

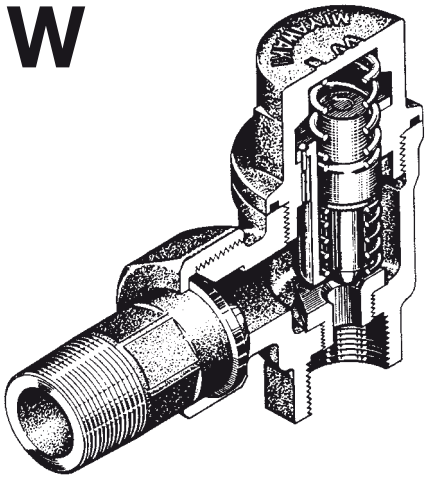


SD1



SERIES W Thermostatic Radiator Trap

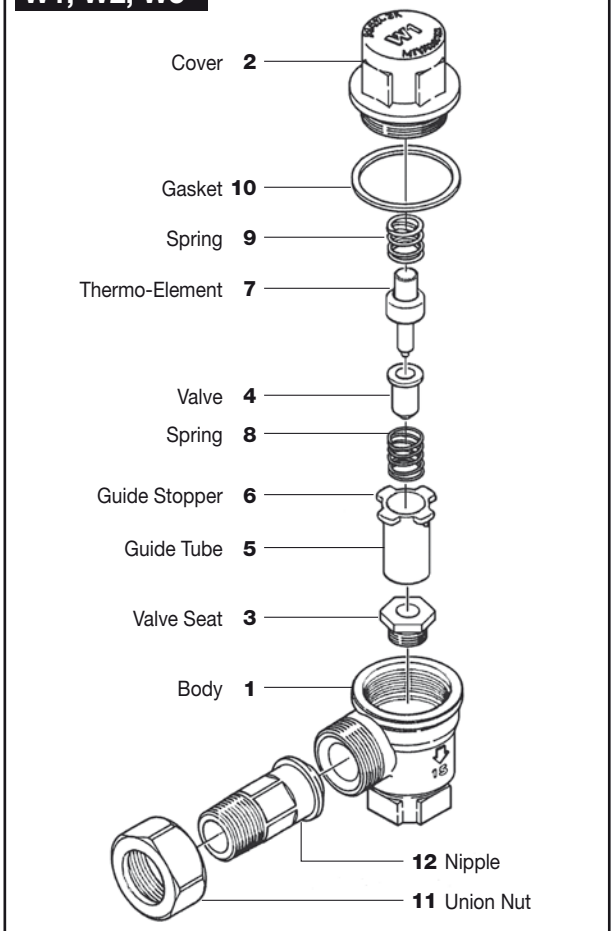
W



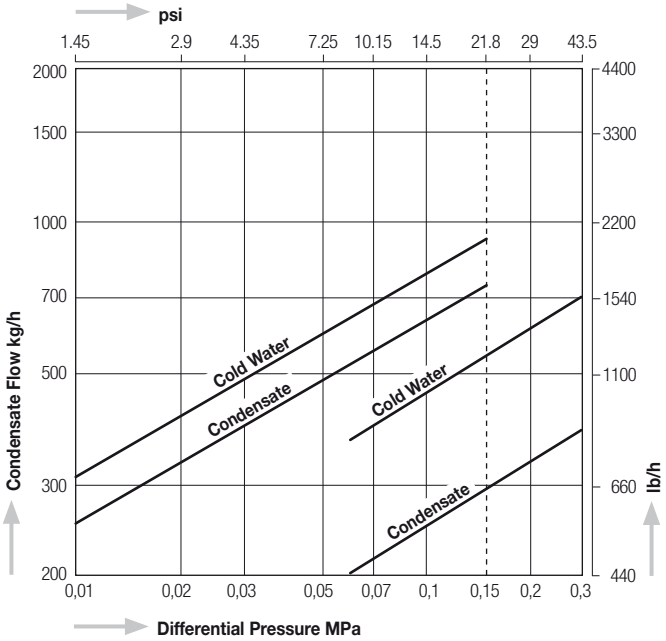
W1

W2

W1, W2, W3



Capacity Charts W1, W2, W3

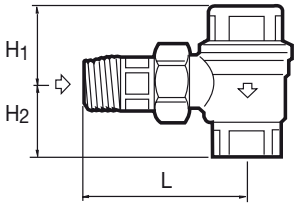


The opening temperature of the valve is preset

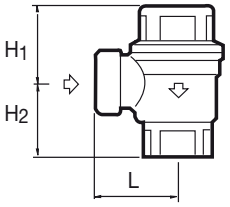
- at about 97°C (207° F) for W1-1,5, W2-1,5 and W3-1,5
- at about 115°C (239° F) for W1-3, W2-3 and W3-3

Dimensions

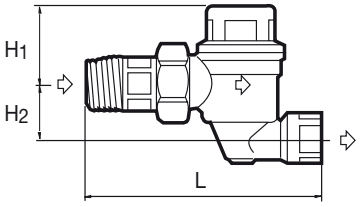
W1



W2



W3



Model	Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Dimensions (mm)			Dimensions (in)			Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	L	H_1	H_2		kg	lb
W1-1,5	Screwed Rc, NPT	½"	0,01 – 0,15	1.45 – 21.8	150	302	80	39	35	3.1	1.5	1.4	Brass C3771	0,5	1.1
		¾"					87		41	3.4		1.6		0,6	1.3
W1-3		½"	0,06 – 0,3	8.7 – 43.5			80		35	3.1		1.4		0,5	1.1
		¾"					87		41	3.4		1.6		0,6	1.3
W2-1,5	Screwed Rc, NPT	½"	0,01 – 0,15	1.45 – 21.8	150	302	35	39	35	1.4	1.5	1.4	Brass C3771	0,4	0.9
		¾"							41			1.6		0,5	1.1
W2-3		½"	0,06 – 0,3	8.7 – 43.5					35			1.4		0,4	0.9
		¾"							41			1.6		0,5	1.1
W3-1,5	Screwed Rc, NPT	½"	0,01 – 0,15	1.45 – 21.8	150	302	123	39	28	4.8	1.5	1.1	Brass C3771	0,6	1.3
		¾"					135		34	5.3		1.4		0,7	1.5
W3-3		½"	0,06 – 0,3	8.7 – 43.5			123		28	4.8		1.1		0,6	1.3
		¾"					135		34	5.3		1.4		0,7	1.5

Inverted Bucket Steam Traps

SERIES E

Inverted Bucket Steam Traps belong to the family of mechanical traps. They operate on the difference in density between steam and water. MIYAWAKI offers a very wide range of inverted bucket steam traps for small up to large condensate loads. Inverted bucket steam traps discharge the condensate intermittently.

Types

ES	Cast Iron Inverted Bucket Steam Traps for small up to medium condensate loads
ESU	Stainless Steel Inverted Bucket Steam Traps for small up to medium condensate loads
ER	Cast Iron Inverted Bucket Steam Traps for medium up to high condensate loads
ESH, ER25	Cast Steel Inverted Bucket Steam Traps for high pressure and small up to high condensate loads

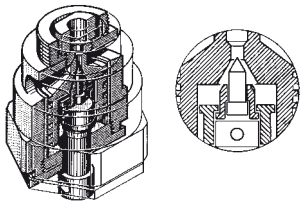
Features

- All traps are equipped with stainless steel wear and corrosion resistant lever, valve and seat system for long and troubleless life.
- All valves and seats are lapped together.
- Traps of the series ER contain the patented SCCV® (Self Closing and Centering Valve) – System, which increases the lifetime of the valve and seat substantially.
- A small hole in the top of the bucket secures continuous automatic air venting.
- All traps are designed for quick and easy inline repairability.
- Witstands high back pressure (up to 90%).

Application

Heat exchangers, dryers, unit heaters, sterilizers and other applications, where condensate must be removed immediately

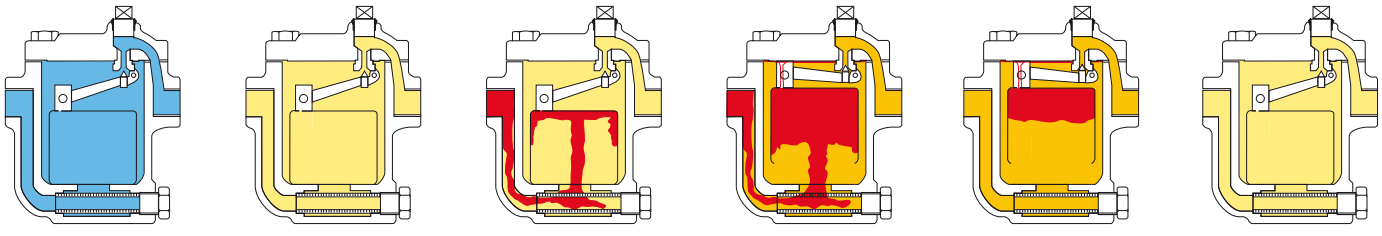
Super-Discharger



1. Incorporates the **MIYAWAKI SCCV®-System** (see pages 74 – 75)
2. Double valve system with needle pilot valve and main valve (for ER Type)
3. Operates by the pressure difference inside the valve unit
4. Makes the discharge capacity very large
5. Designed for high pressure up to 6,4 MPa (925 psig) – only for ER25

Operating principle

cold condensate hot condensate steam



1 & 2

On start-up the bucket is down and the valve is open. Low temperature condensate and air, later high temperature condensate enter the trap. The condensate fills the bucket and the trap body completely. As the bucket is completely submerged in the water, it lies on the bottom of the trap, the valve is wide open and condensate will discharge.

3 & 4

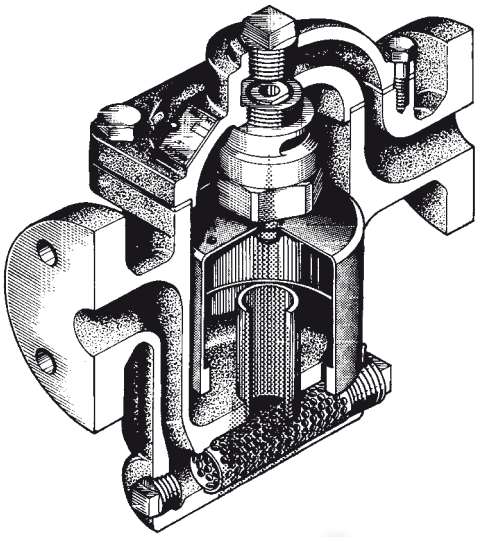
Steam enters the trap under the bottom of the bucket. The more steam is entering the trap, the more it collects at the top of the bucket, causing the bucket to move upwards (buoyancy of the bucket inside the water). At the top position of the bucket the valve will close the seat.

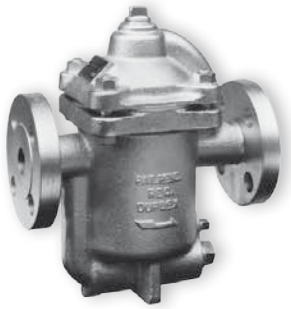
5 & 6

Air and gases pass through a small hole in the top of the bucket and collect at the top of the trap. Steam is also passing through the hole and condensing. When more condensate is entering the trap, the bucket will loose its buoyancy and will move down. The valve will open and condensate will discharge.

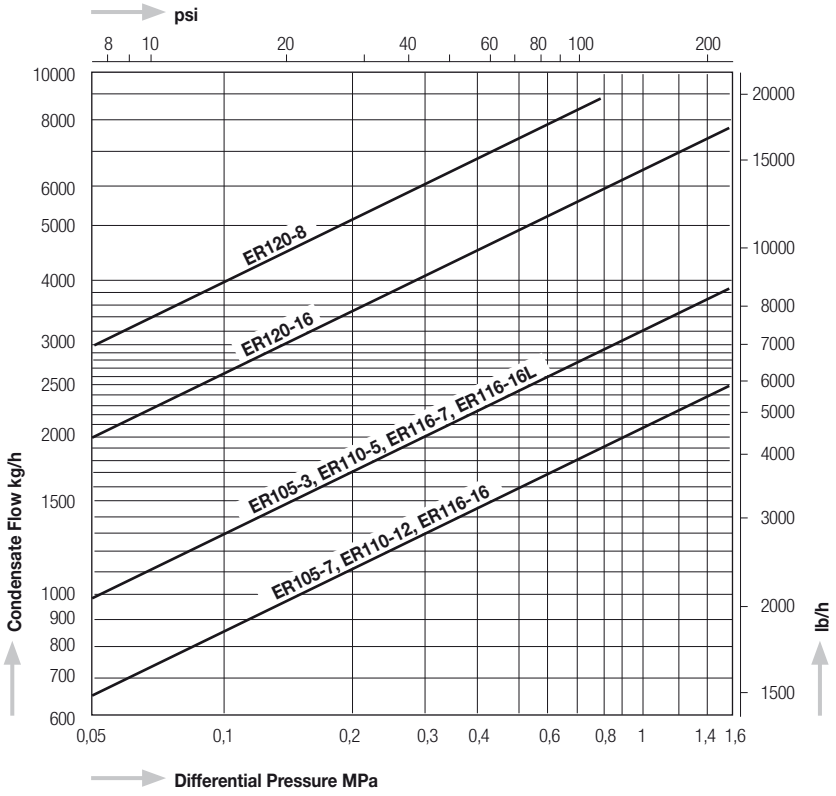
SERIES E Inverted Bucket Trap – Low Pressure / Large Capacity

ER



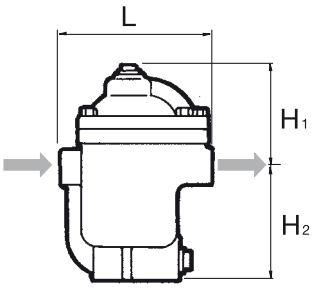


Capacity Chart ER

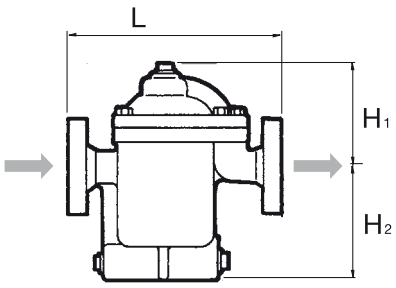


Dimensions

ER105

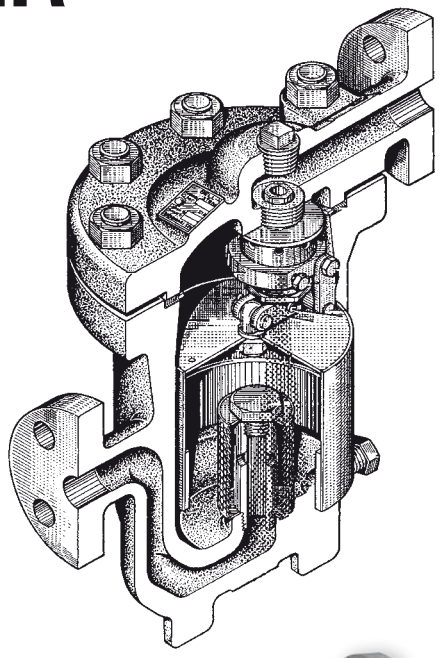


ER105F, ER110, ER116, ER120

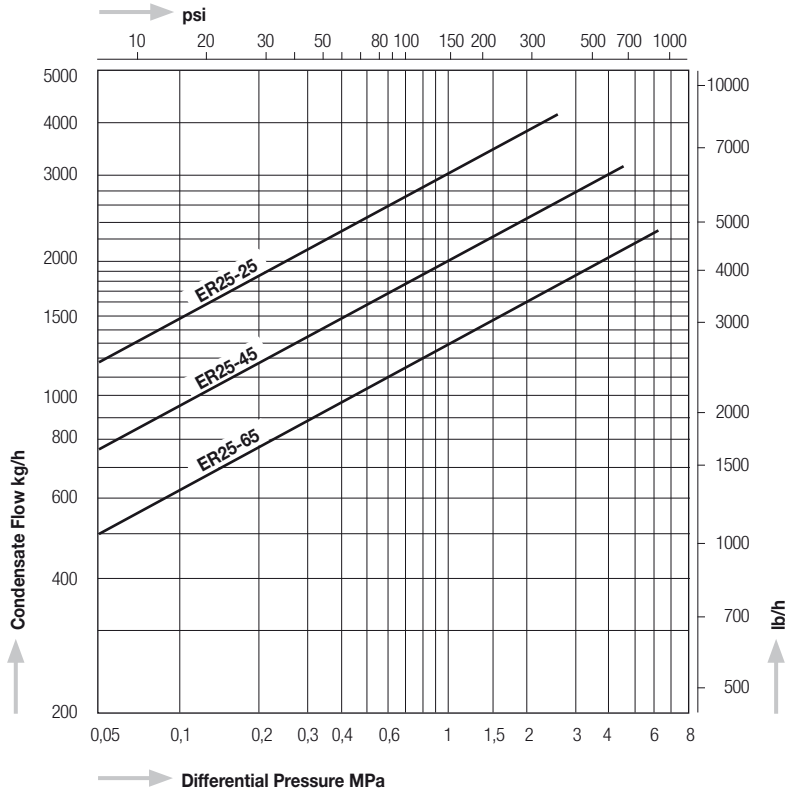


Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)			Dimensions (in)			Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	L	H_1	H_2		kg	lb
ER105 - 3	Screwed Rc, NPT	¾" – 1½"	0,3	43	220	428	190	155	134	7.5	6.1	5.3	Cast Iron FC250	10,2	22.5
ER105 - 7			0,7	100											
ER105F - 3	Flanged JIS, ASME, DIN	½" – 1"	0,3	43			254	155	134	10.0	6.1	5.3		13,6	29.9
		1¼" – 2"					260			10.2				15,1	33.2
ER105F - 7		½" – 1"	0,7	100			254	155	134	10.0	6.1	5.3		13,6	29.9
		1¼" – 2"					260			10.2				15,1	33.2
ER110 - 5	Flanged JIS, ASME, DIN	½" – 1"	0,5	73			254	200	140	10.0	7.9	5.5		16,1	35.4
		1¼" – 2"					280	210	130	11.0	8.3	5.1		18,1	39.8
ER110 - 12		½" – 1"	1,2	174			254	200	140	10.0	7.9	5.5		16,1	35.4
		1¼" – 2"					280	210	130	11.0	8.3	5.1		18,1	39.8
ER116 - 7	Flanged JIS, ASME, DIN	½" – 1"	0,7	100	300	572	300	230	132	11.8	9.1	5.2	Ductile Cast Iron FCD450	19,0	41.8
		1¼" – 2"						190	167		7.5	6.6		23,0	50.6
ER116 - 16		½" – 1"	1,6	230			300	230	132	11.8	9.1	5.2		19,0	41.8
		1¼" – 2"						190	167		7.5	6.6		23,0	50.6
ER120 - 8	Flanged JIS, ASME, DIN	1½" – 2½"	0,8	116	220	428	400	220	217	15.8	8.7	8.5	Cast Iron FC250	46,0	101.2
ER120 - 16			1,6	230											

ER



Capacity Chart **ER**



* Available options **ER25**

Max. operating temperature 470°C (878°F)
with body material WC6

Dimensions **ER**

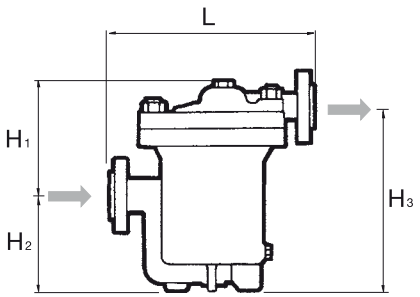


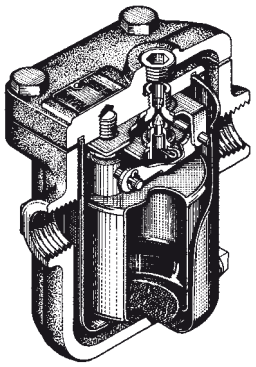
Table 1: **Dimensions**

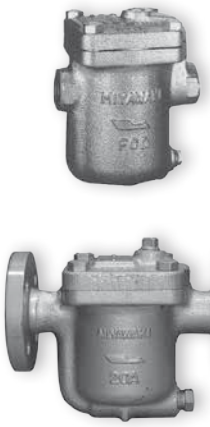
Size (in)	Flange Standards		L (mm)	L (in)
½¨ – 1¨	JIS 10 – 40 K	ASME 150 lb / 300 lb RF	340	13.4
	ASME 600 lb RF	ASME 150 – 600 lb RJ	345	13.6
	JIS 63 K	ASME 900 lb RF / RJ	380	15.0
1¼¨ – 2¨	JIS 10 – 40 K	ASME 150 – 600 lb RF / RJ	380	15.0
	JIS 63 K	ASME 900 lb RF / RJ	400	15.8

Model		Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
				MPa	psig	°C	°F	L	H_1	H_2	H_3	L	H_1	H_2	H_3		kg	lb
ER25 -	25	Flanged JIS, ASME, DIN	½¨ – 2¨	2,5	360	425*	800	Table 1	210	180	345	Table 1	8.3	7.1	13.6	Cast Steel SCPH2	½¨ – 1¨ 51 1¼¨ – 2¨ 58	112.2 127.6
	45			4,4	640													
	65			6,4	925													
ER25W -	25	Socket Weld ASME, DIN	½¨ – 2¨	2,5	360	425*	800	1/2¨ – 1 1/2¨ 340 2¨ 380	210	180	345	1/2¨ – 1 1/2¨ 13.4 2¨ 15.0	8.3	7.1	13.6		48	105.6
	45			4,4	640													
	65			6,4	925													

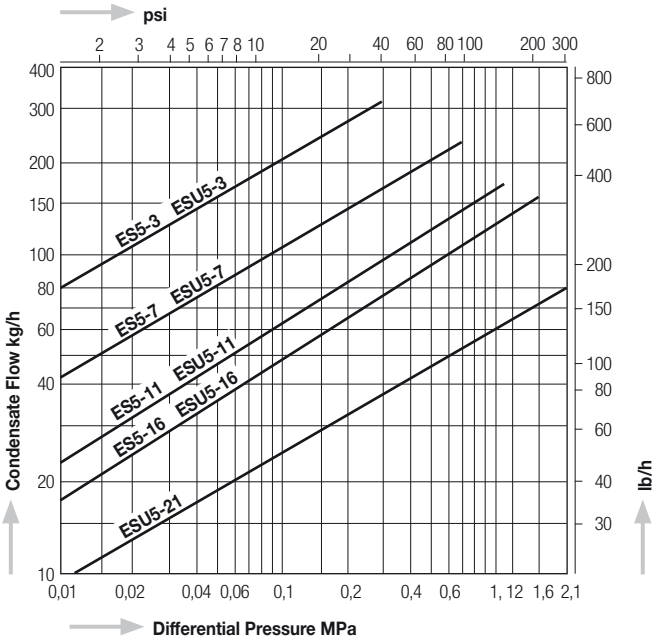
SERIES E Inverted Bucket Trap – Low Pressure

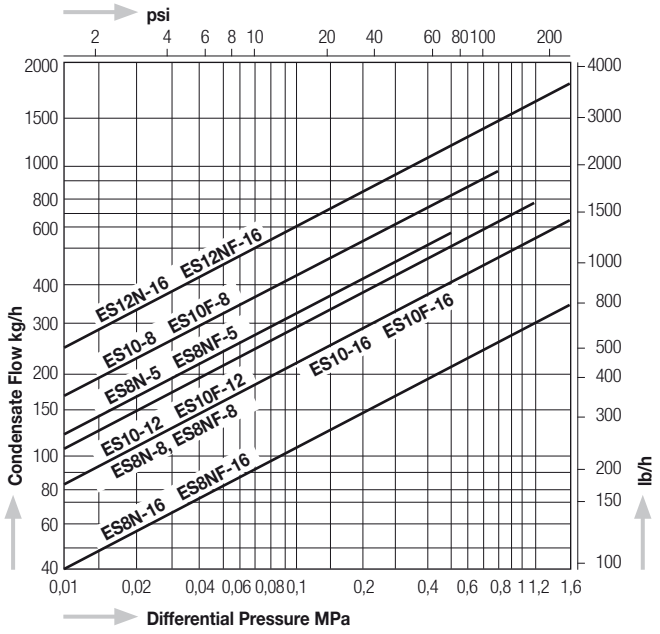
ES





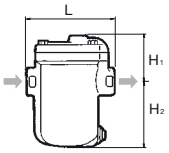
Capacity Charts ES



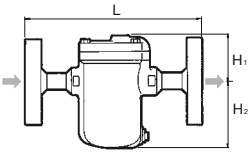


Dimensions

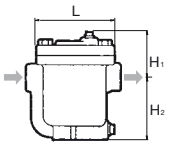
ES5, ESU5



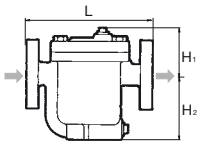
ESU5F



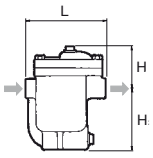
ES8N



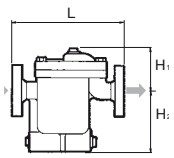
ES8NF



ES10

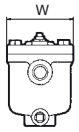


ES10F, ES12N

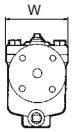


All types

Screwed



Flanged



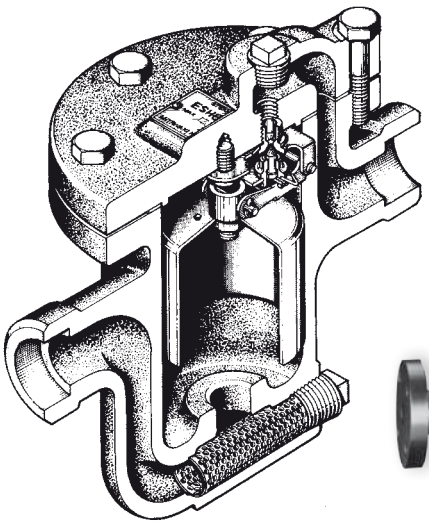
Available options

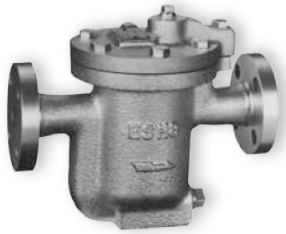
Depending on the Maximum Operating Pressure the following types are available:

Model	Max. Operating Pressure MPa	Max. Operating Pressure psig
ES5 - 3	0,3	43
ES5 - 7	0,7	100
ES5 - 11	1,1	160
ES5 - 16	1,6	230
ESU5 - 3	0,3	43
ESU5 - 7	0,7	100
ESU5 - 11	1,1	160
ESU5 - 16	1,6	230
ESU5 - 21	2,1	300
ES8N - 5	0,5	73
ES8N - 8	0,8	116
ES8N - 16	1,6	230
ES10 - 8	0,8	116
ES10 - 12	1,2	174
ES10 - 16	1,6	230

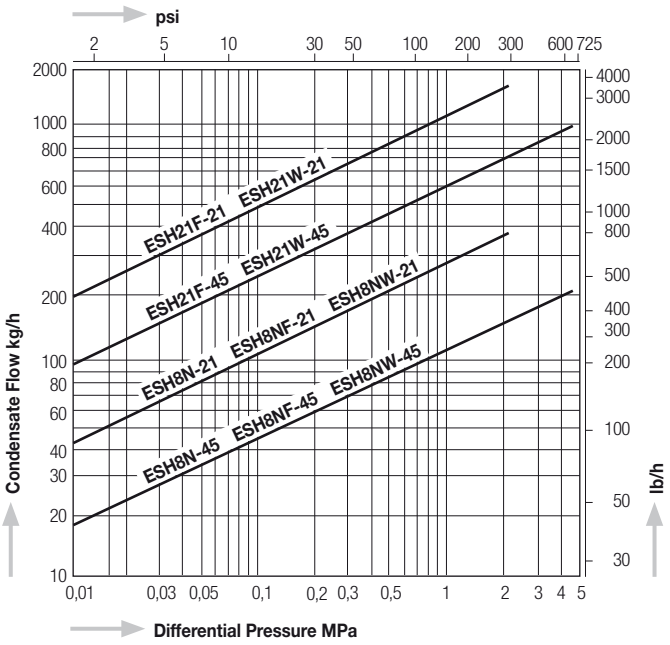
Model	Connections	Size (in)	Max. Operating Pressure MPa	Max. Operating Pressure psig	Max. Operating Temperature °C	Max. Operating Temperature °F	Dimensions (mm) L	H1	H2	W	Dimensions (in) L	H1	H2	W	Body Material	Weight kg	Weight lb
ES5	Screwed Rc, NPT	½"	1,6	230	350	662	103	59	67	75	4.1	2.3	2.6	3.0	Ductile Cast Iron FCD450	1,9	4.2
		¾"					105	57	69		4.1	2.2	2.7			1,9	4.2
		1"					109				4.3					2,0	4.4
ESU5	Screwed Rc, NPT	½"	2,1	305			103	57	69	75	4.1	2.2	2.7	3.0	Stainless Steel SCS13A	1,9	4.2
		¾"					105				4.1					2,0	4.4
		1"					109				4.3					2,1	4.6
ESU5F	Flanged JIS, ASME, DIN	½"					175	57	69	75	6.9	2.2	2.7	3.0		3,5	7.7
		¾"					195				7.7					3,7	8.2
		1"					215				8.5					4,1	9.0
ES8N	Screwed Rc, NPT	½"	1,6	230	350	662	130	73	90	100	5.1	2.9	3.5	3.9	Ductile Cast Iron FCD450	3,7	8.2
		¾"															
		1"					135				5.3					3,9	8.6
ES8NF	Flanged JIS, ASME, DIN	½"					175	73	90	100	6.9	2.9	3.5	3.9		5,3	11.7
		¾"					195	68	95		7.7	2.7	3.7			5,7	12.5
		1"					215				8.5					6,8	15.0
ES10	Screwed Rc, NPT	¾" – 1½"	1,6	230	220	428	190	102	134	120	7.5	4.0	5.3	4.7	Cast Iron FC250	9,3	20.5
ES10F	Flanged JIS, ASME, DIN	½" – 1"					254	102	134	120	10.0	4.0	5.3	4.7		12,7	28.0
		1¼" – 2"					260				10.2					14,2	31.2
ES12N		½" – 1"	1,6	230			270	140	140	120	10.6	5.5	5.5	4.7		13,5	29.7
		1¼" – 2"					280	150	130		11.0	5.9	5.1			15,1	33.2

ESH



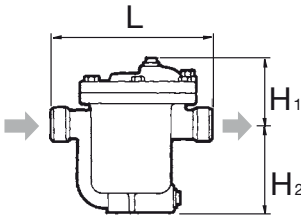


Capacity Chart ESH

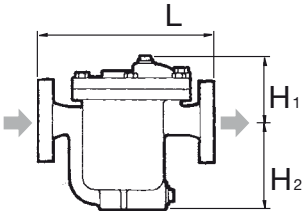


Dimensions

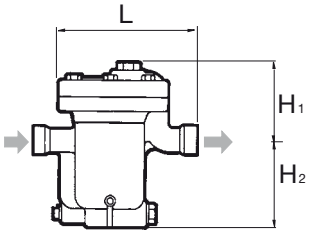
ESH8N, ESH8NW



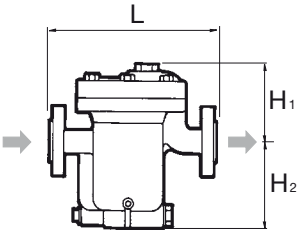
ESH8NF



ESH21W

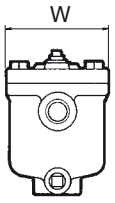


ESH21F

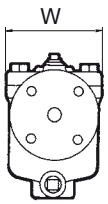


All types

Screwed, Socket Weld



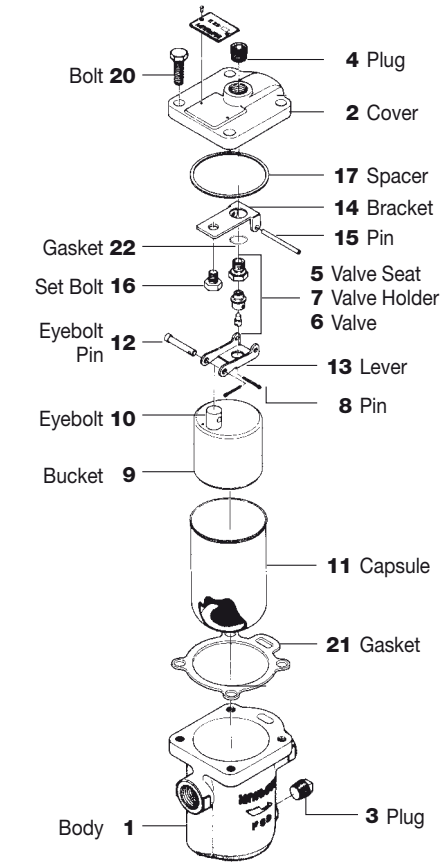
Flanged



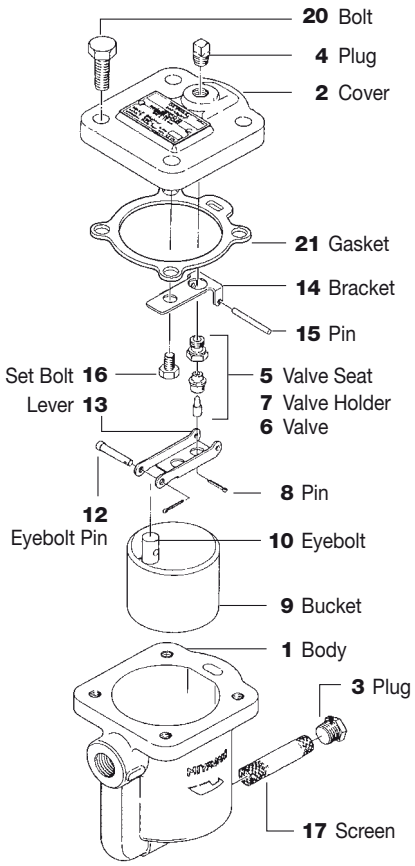
Model		Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
				MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
ESH8N -	**21**	Screwed Rc, NPT	½" – 1"	2,1	305	400	752	½" – ¾" = 220 1" = 224	114	111	146	½" – ¾" = 8.7 1" = 8.8	4.5	4.4	5.7	Cast Steel SCPH2	11,0	24.2
	45			4,4	640													
ESH8NF -	**21**	Flanged JIS, ASME, DIN	½" – 1"	2,1	305			250	114	111	146	9.8	4.5	4.4	5.7		½", ¾" = 12,3 1" = 13,1	27.1 28.8
	45			4,4	640													
ESH8NW -	**21**	Socket Weld ASME, DIN	½" – 1"	2,1	305			220	114	111	146	8.7	4.5	4.4	5.7		11,0	24.2
	45			4,4	640													
ESH21F -	**21**	Flanged JIS, ASME, DIN	½" – 1"	2,1	305			350	145	160	205	13.8	5.7	6.3	8.1		31,0	68.2
	45			4,4	640													
ESH21W -	**21**	Socket Weld ASME, DIN	½" – 1"	2,1	305			300	145	160	205	11.8	5.7	6.3	8.1		28,0	61.6
	45			4,4	640													

SERIES E Spare Parts

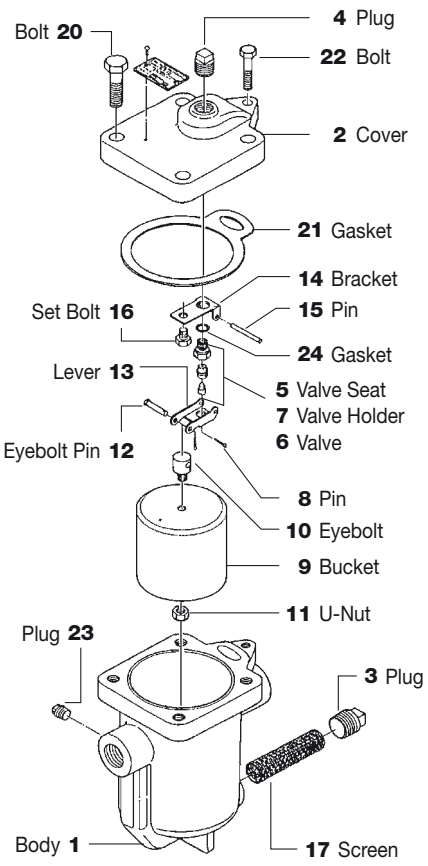
ES5/ESU5



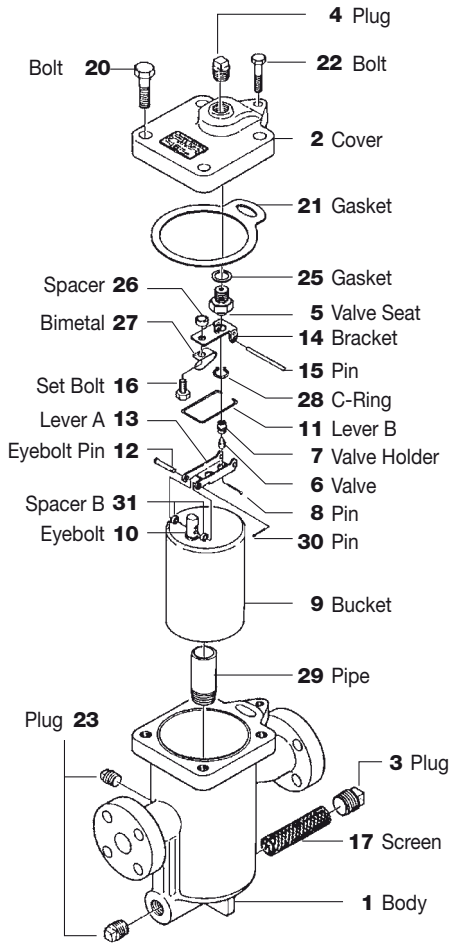
ES8N



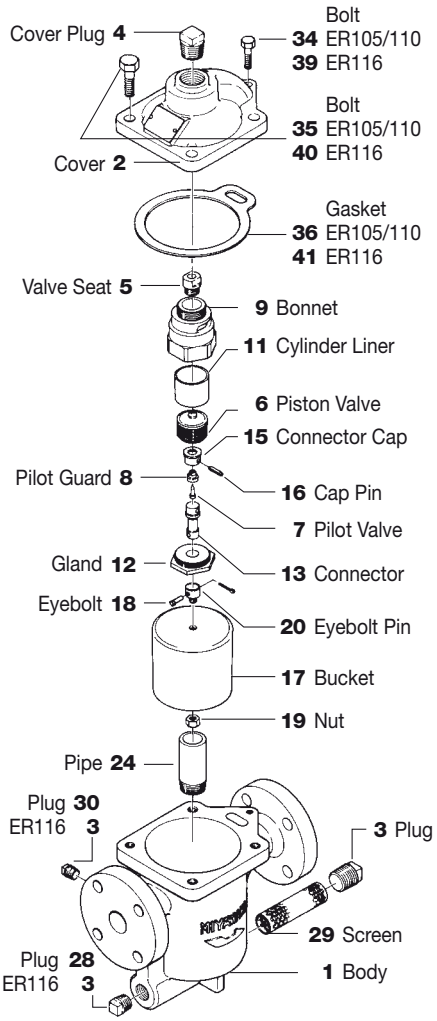
ES10



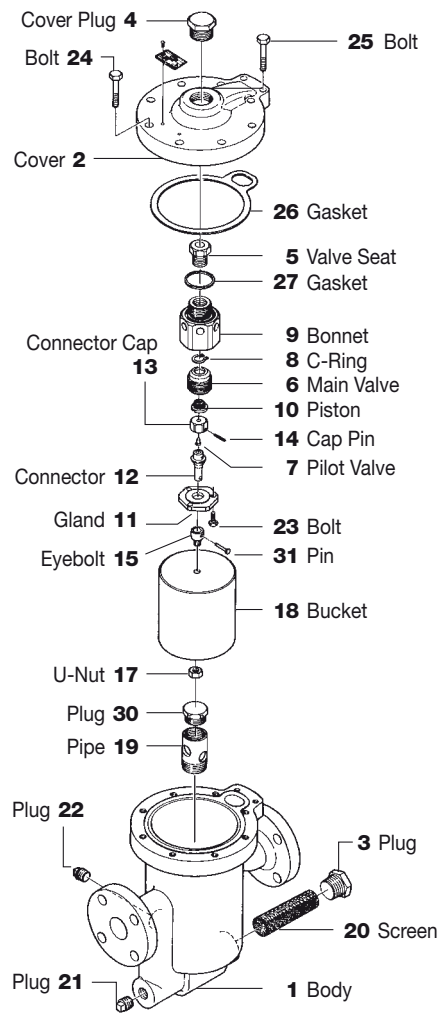
ES12N



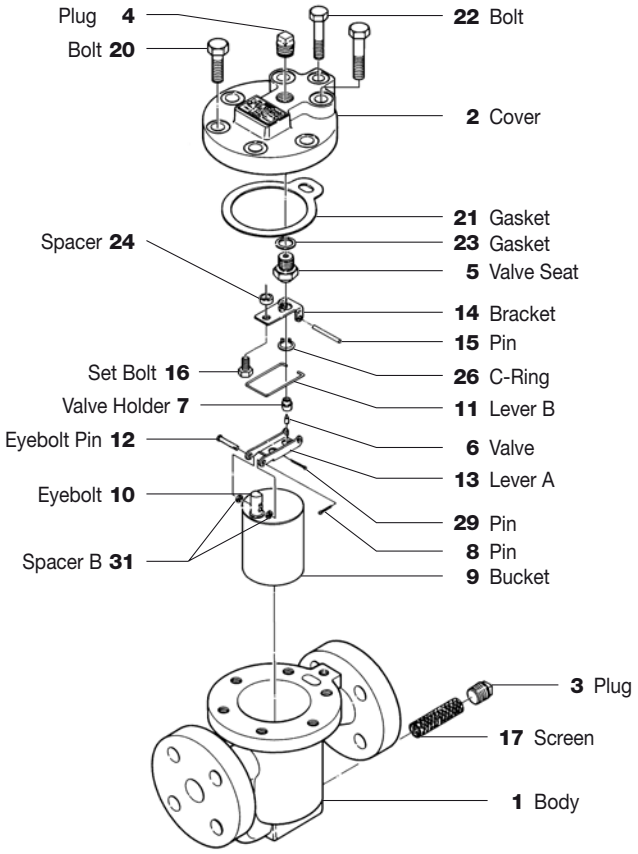
ER105/110/116



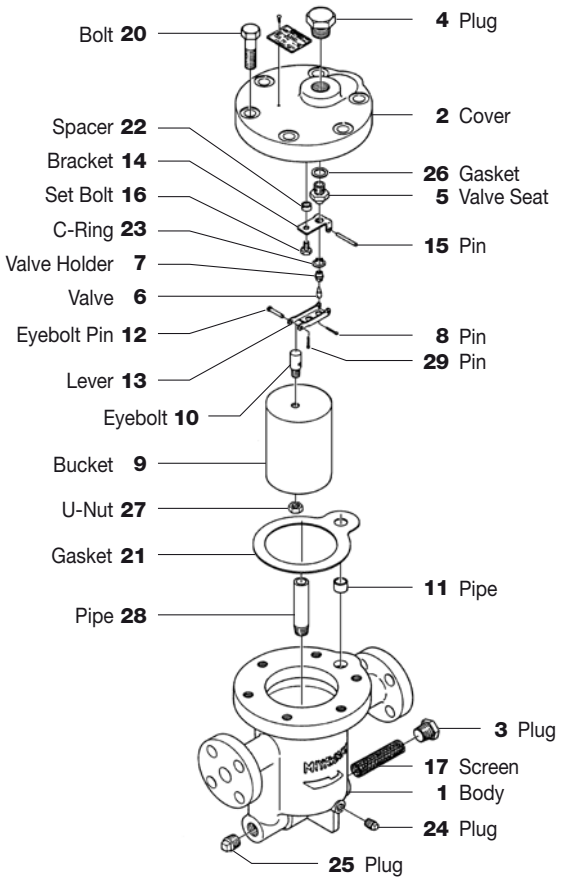
ER120



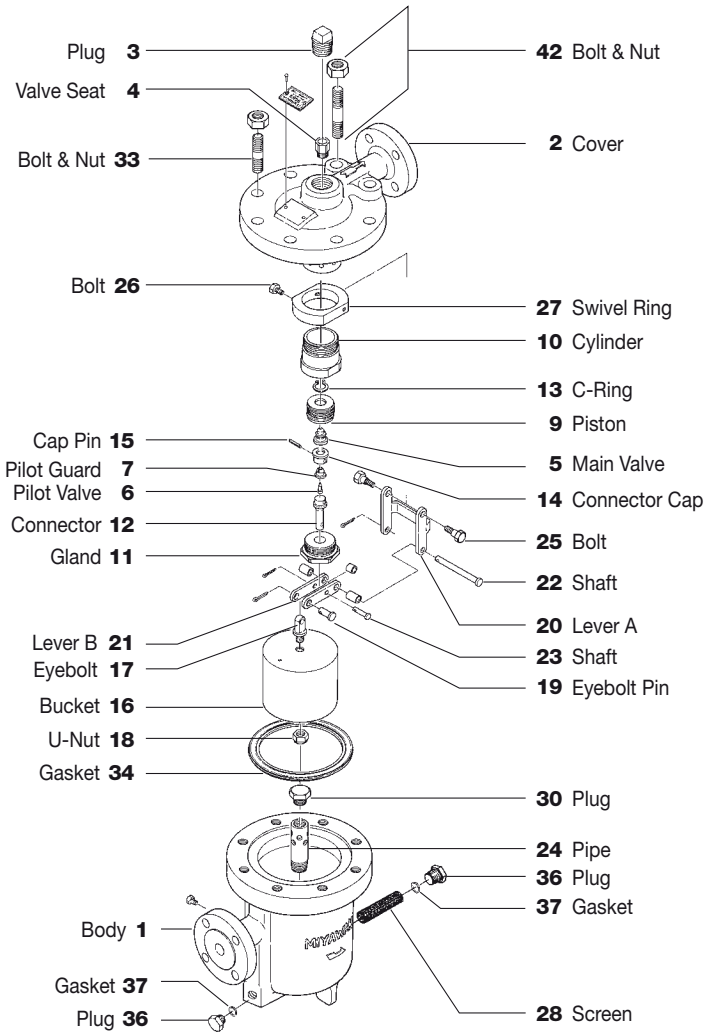
ESH8N



ESH21



ER25



MEMO

Ball Float Steam Traps

SERIES G

Ball Float Steam Traps belong to the family of mechanical traps. They operate on the difference in density between steam and water. A ball float is connected with a lever to the valve and seat. Condensate will be discharged once it reaches a certain level inside the trap. Condensate is discharged continuously.

Types

G11N & G12N	Cast Iron Steam Traps for small and medium condensate loads
G15N	Cast Iron Steam Trap for low pressure and large condensate loads
G3N-G5, G2-G8	Cast Iron Steam Traps for large condensate loads
G20	Ductile Cast Iron Steam Trap for medium condensate loads
GH3N-GH5, GH2-GH8 GH50, GH60	Cast Steel Steam Traps for large condensate loads
GH40, GTH12	Cast Steel Steam Traps for medium condensate loads
GC1, GC1V	Stainless Steel Steam Traps for small condensate loads
GC20	Stainless Steel Steam Trap for medium condensate loads

Features

- All traps are equipped with stainless steel wear and corrosion resistant float, lever, valve and seat systems for a long and problem free operation.
- Each ball float steam trap is equipped with an air vent for venting air and gases at the time of start-up and during operation.
- The large capacity steam traps like G2-G8,GH2-GH8 use a double ported balance valve system, which is small in its physical size compared with the very high capacity of the traps.
- All traps are designed for quick and easy maintenance.
- **Available options:** Lock release valve for G11N and G12N

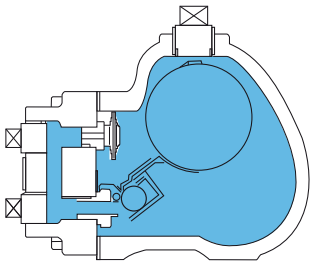
Application

Ball Float Steam Traps can be used in all process applications, like all kind of heat exchangers, tank and unit heaters and others, where condensate must be removed immediately after it forms.

The type GC1 is especially designed for applications in the food, pharmaceutical and other industries with small condensate loads and the need for stainless steel bodies. It can be also installed for drainage of steam main lines.

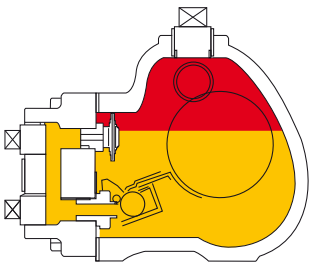
Operating principle

cold condensate steam / hot air hot condensate



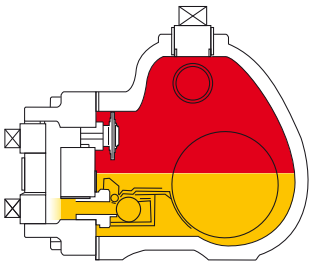
1

On start-up air is quickly discharged through the thermostatic air vent (membrane or bimetal type). Cold condensate fills the steam trap body.
As soon as a certain water level is reached, the float rises and opens the valve. The cold condensate is discharged through the open valve and the open air vent.



2

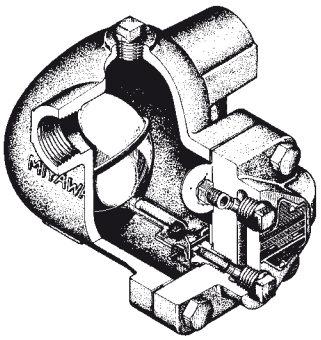
When the condensate reaches saturation temperature, the air vent closes and condensate is discharged only through the main valve orifice.
The condensate forms a water seal inside the trap body, which prevents live steam loss at all times.

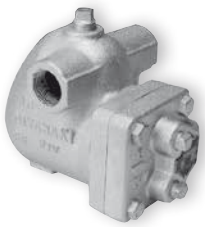


3

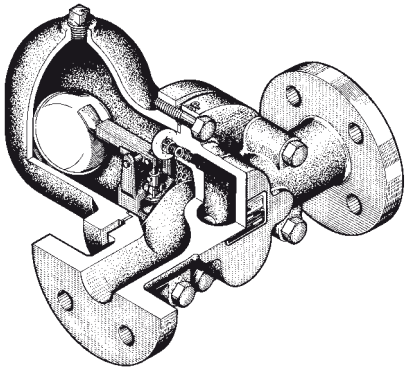
The opening degree of the valve is regulated by the water level inside the trap body. Condensate is discharged continuously.
As long as air enters the trap and accumulates at the top of the trap body, the temperature cools down a little bit and the air vent, which opens slightly below saturation temperature, begins to discharge the air from the trap.

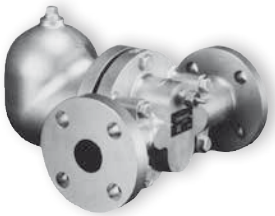
G11N, G12N



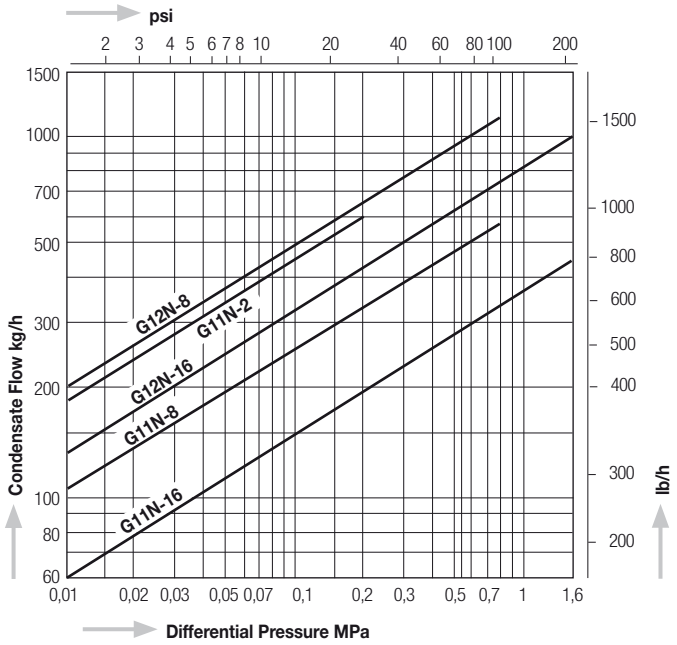


G15N

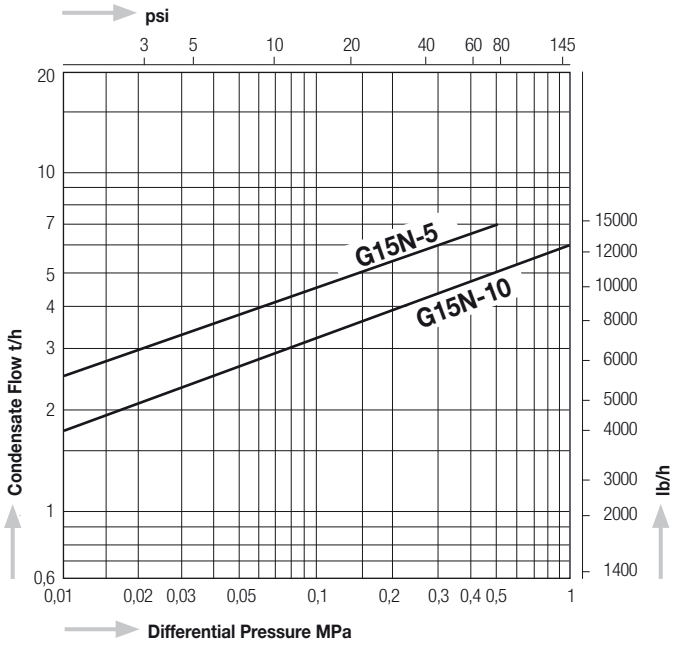




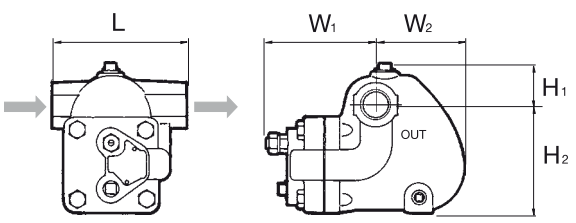
Capacity Chart **G11N, G12N**



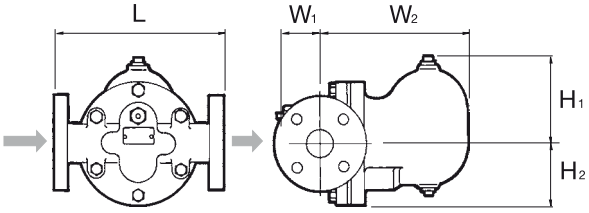
Capacity Chart **G15N**



Dimensions **G11N, G12N**

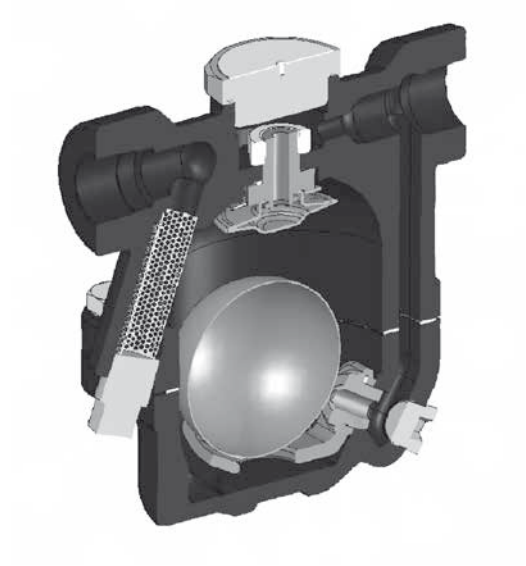


G15N

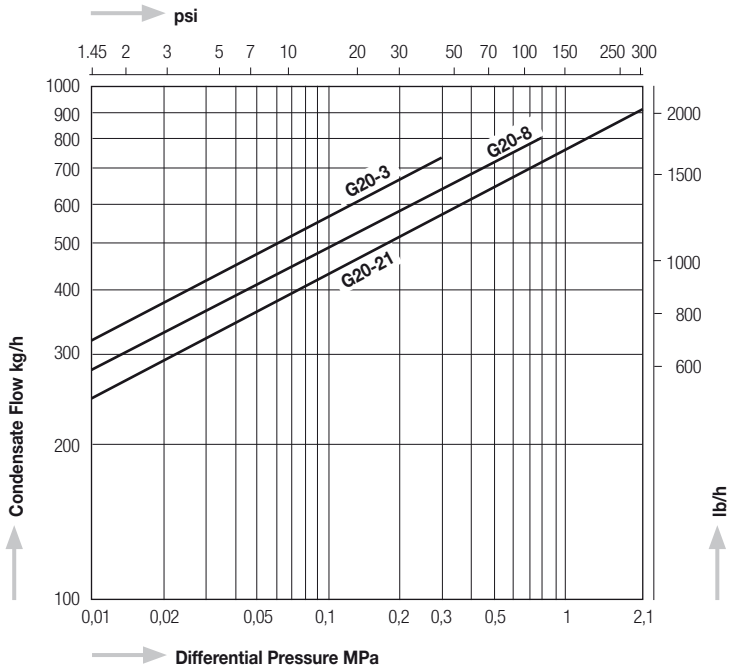


Model		Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)					Dimensions (in)					Body Material	Weight	
				MPa	psig	°C	°F	L	H_1	H_2	W_1	W_2	L	H_1	H_2	W_1	W_2		kg	lb
G11N -	2	Screwed Rc, NPT	½", ¾"	0,2	29	220	428	120	37	92	97	60	4.7	1.5	3.6	3.8	2.4	Cast Iron FC250	3,9	8.6
	8			0,8	116															
	16			1,6	230															
G12N -	8	Screwed Rc, NPT	¾", 1"	0,8	116	220	428	140	47	113	102	92	5.5	1.9	4.4	4.0	3.6		5,9	13.0
	16			1,6	230															
G15N -	5	Flanged ASME, DIN	1¼" – 2"	0,5	73	220	428	300	130	90	30	230	11.8	5.1	3.5	1.2	9.1		20,0	44.0
	10			1,0	145															

G20



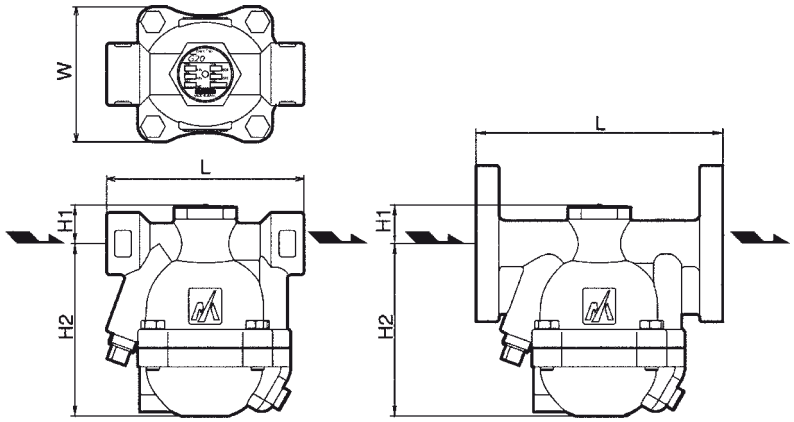
Capacity Chart



Screwed

Flanged Connection

Dimensions



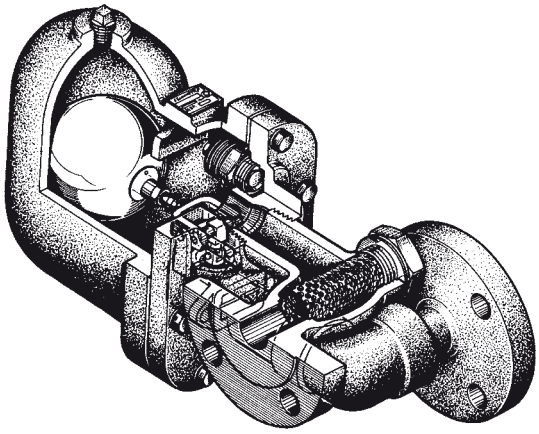
Available versions **G20**

Model	Max. Operating Pressure	
	MPa	psig
G20 - 3	0,3	43
G20 - 8	0,8	116
G20 - 21	2,1	305

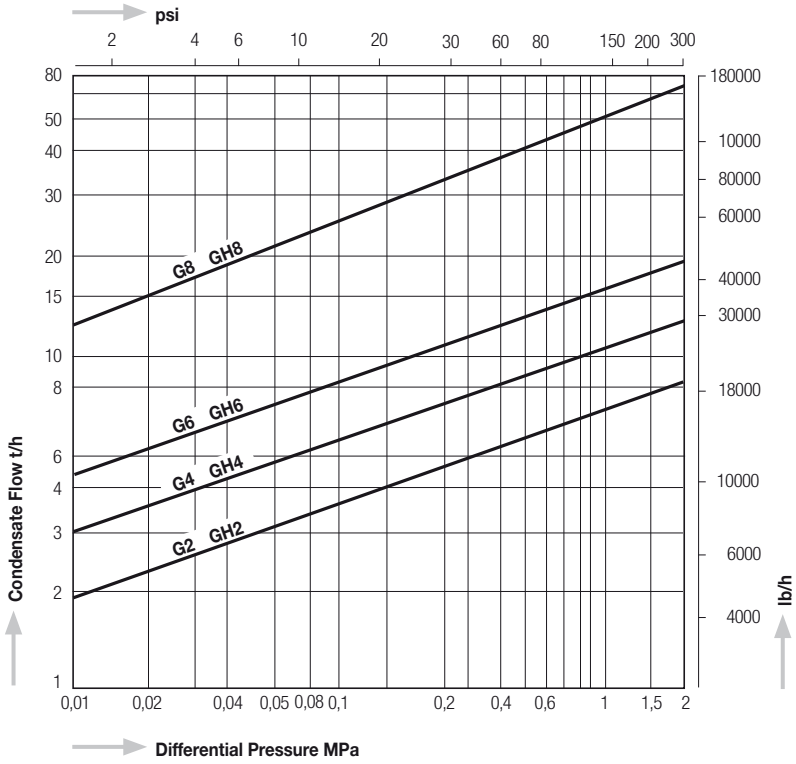
Model	Connections	Size (in)	Max. Operating Pressure, PMO		Max. Operating Temperature, TMO		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
G20	Screwed Rc, NPT	½"	2,1	305	220	428	120	24	105	82	4.7	1.0	4.1	3.2	Ductile Cast Iron FCD450	2,5	5.5
		¾"							105				4.1			2,5	5.5
		1"							107				4.2			2,6	5.7
G20F	Flanged JIS, ASME	½"					150	24	105	82	5.9	1.0	4.1	3.2		3,7*	8.1*
		¾"					150				5.9					4,2*	9.2*
		1"					160				6.3					4,8*	10.6*
	Flanged DIN	DN 15					150				5.9					3,7	8.1
		DN 20					150				5.9					4,2	9.2
		DN 25					160				6.3					4,8	10.6

***Depending on the flange rating the weight may differ.**

G2, G4, G6, G8
GH2, GH4, GH6, GH8

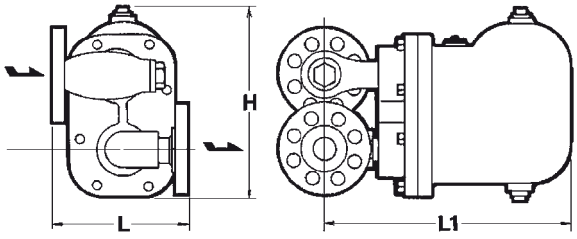


Capacity Chart

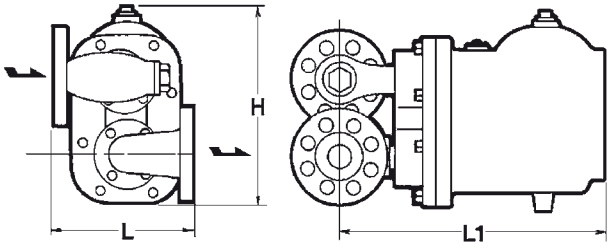


Dimensions

G2 / GH2

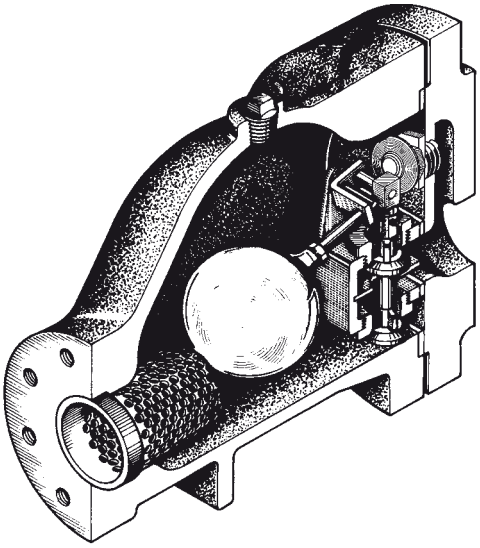


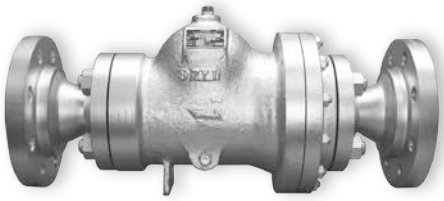
G4, G6, G8 / GH4, GH6, GH8



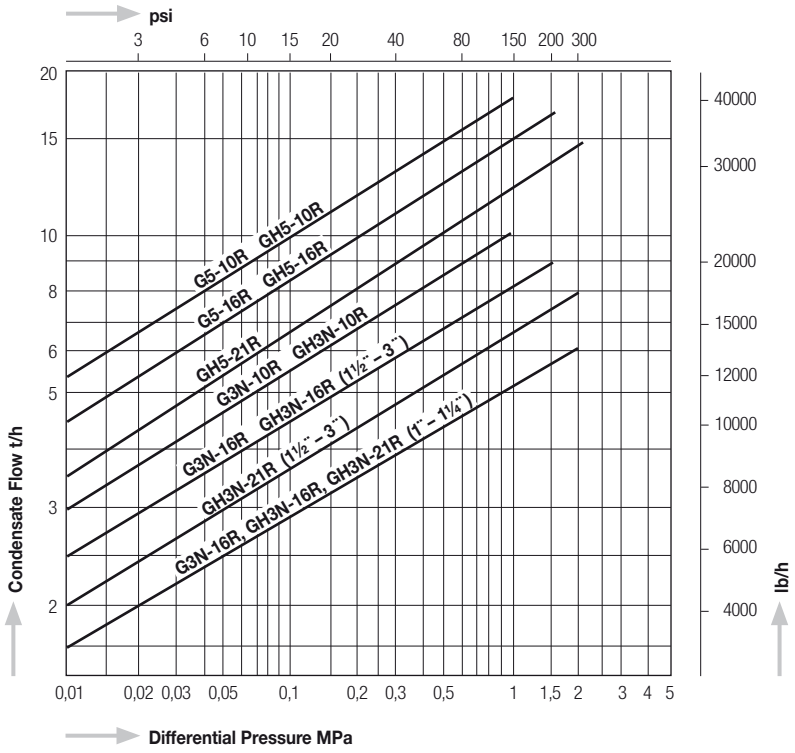
Model	Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Dimensions (mm)			Dimensions (in)			Body Material	Weight	
			MPa	psig	°C	°F	L	L_1	H	L	L_1	H		kg	lb
G2	Flanged JIS, ASME, DIN	1¨	0,01 – 1,6	1.5 – 230	220	428	175	310	250	6.9	12.2	9.8	Cast Iron FC250	22	48.4
		1¼¨					180			7.1					
		1½¨, 2¨					190			7.5					
G4		1¼ ¨ – 2¨					200	380	320	7.9	14.9	12.6		40	88.0
G6		1½ ¨ – 3¨					270	410	350	10.6	16.1	13.8		64	140.8
G8		3¨, 4¨					350	570	480	13.8	22.4	19.9		150	330.0
GH2	Flanged JIS, ASME, DIN	1¨ – 1½¨	0,01 – 2,0	1.5 – 290	400	752	200	310	235	7.9	12.2	9.1	Cast Steel SCPH2	25	55.0
		2¨					210			8.3					
GH4		1¼¨ – 2¨					200	380	320	7.9	14.9	12.6		45	99.0
GH6		1½¨ – 3¨					270	415	345	10.6	16.3	13.6		70	154.0
GH8		3¨, 4¨					350	590	470	13.8	23.2	18.5		165	363.0

G3N, G5
GH3N, GH5

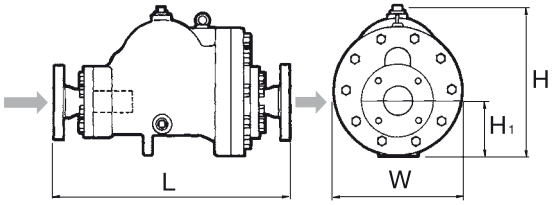




Capacity Chart



Dimensions G3N-R, G5-R, GH3N-R, GH5-R



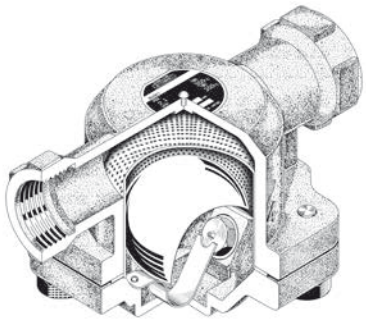
Model		Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)			Body Material	Weight	
				MPa	psig	°C	°F	L	H	H1	W	H	H1	W		kg	lb
G3N -	10R	Flanged	1½" – 3"	1,0	145	235	455	(*1)	140	95	198	5.5	3.7	7.8	Ductile Cast Iron FCD 450	28 – 31 (*2)	62 – 68 (*2)
	16R		1" – 3"	1,6	230												
G5 -	10R		2" – 4"	1,0	145			(*1)	205	110	270	8.1	4.3	10.6		52 – 69 (*2)	114 – 152 (*2)
	16R		2" – 4"	1,6	230												
GH3N -	10R		1½" – 3"	1,0	145	400	752	(*1)	139	106	212	5.5	4.2	8.3	Cast Steel SCPH2	38 – 50 (*2)	84 – 110 (*2)
	16R		1" – 3"	1,6	230												
	21R		1" – 3"	2,1	305												
GH5 -	10R		2" – 4"	1,0	145			(*1)	200	115	270	7.9	4.5	10.6		63 – 80 (*2)	139 – 176 (*2)
	16R		2" – 4"	1,6	230												
	21R		2" – 4"	2,1	305												

All steam traps are available with flanges according to ASME, DIN (EN) and JIS standards.

(*1) Depending on size and flange standard the face-to-face dimensions differ. Please, look at our technical drawings.

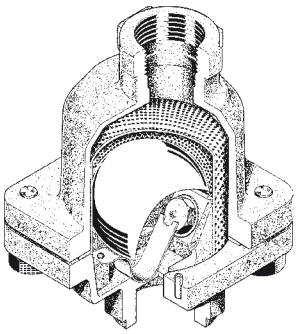
(*2) Depending on size and flange standard the weight of the traps differs. Please, look at our technical drawings.

GC1



Horizontal installation

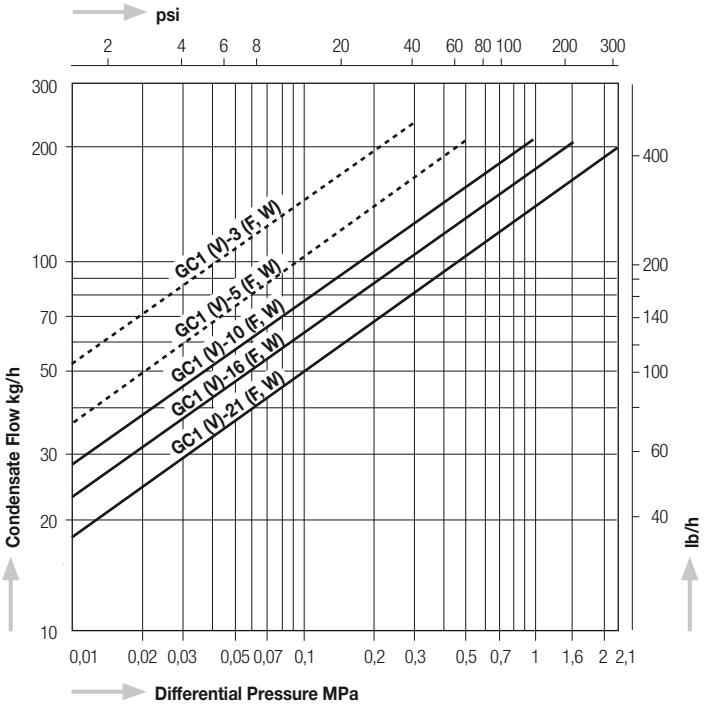
GC1V



Vertical installation

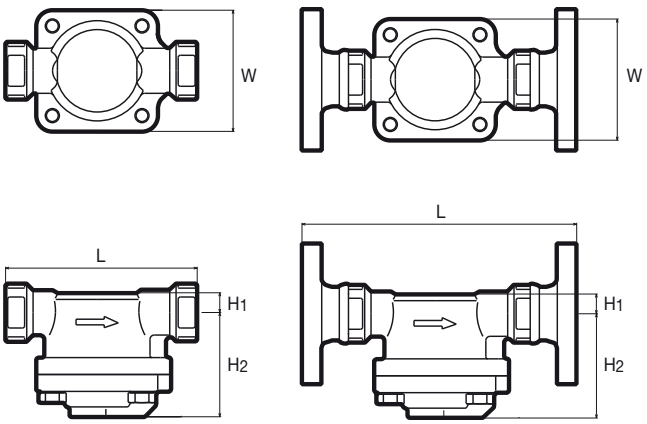
Capacity Chart GC1 / GC1V

Standard ——————
On request - - - - - - - - - - - - - -



Dimensions

GC1



GC1V

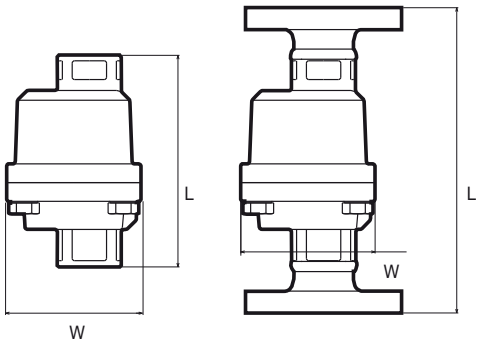
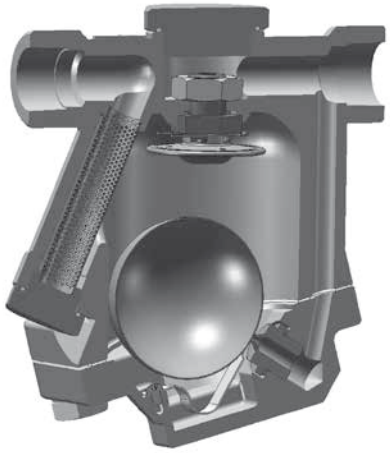


Table 1: Available pressure ranges GC1/GC1V

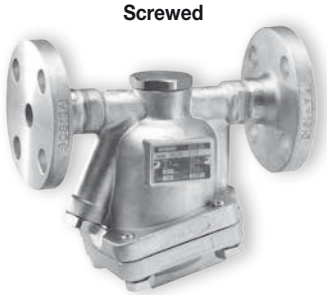
Model		Max. Operating Pressure		
		MPa	psig	
GC1 / GC1V -	**21**	2,1	305	Standard
GC1 / GC1V -	**16**	1,6	230	
GC1 / GC1V -	**10**	1,0	145	
GC1 / GC1V -	**5**	0,5	72.5	On request
GC1 / GC1V -	**3**	0,3	43.5	

Model	Connections	Size (in)	Operating Pressure Range		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
GC1 (GC1V)	Screwed Rc, NPT	½¨	0,01 – 2,1	1.5 – 305	350	662	127	15	75	86	5.0	0.6	3.0	3.4	Stainless Steel SCS13A	1,8	4.0
		¾¨					136				5.4					1,9	4.2
		1¨					140				5.5					2,0	4.4
GC1-W (GC1V-W)	Socket Weld JIS, ASME, DIN	½¨	0,01 – 2,1	1.5 – 305	350	662	127	15	75	86	5.0	0.6	3.0	3.4		1,8	4.0
		¾¨					136				5.4					1,9	4.2
		1¨					140				5.5					2,0	4.4
GC1-F (GC1V-F)	Flanged JIS, ASME, DIN	½¨	0,01 – 2,1	1.5 – 305	350	662	175	15	75	86	6.9	0.6	3.0	3.4		3,3	7.3
		¾¨					195				7.7					4,5	9.9
		1¨					215				8.5					5,3	11.7

GC20



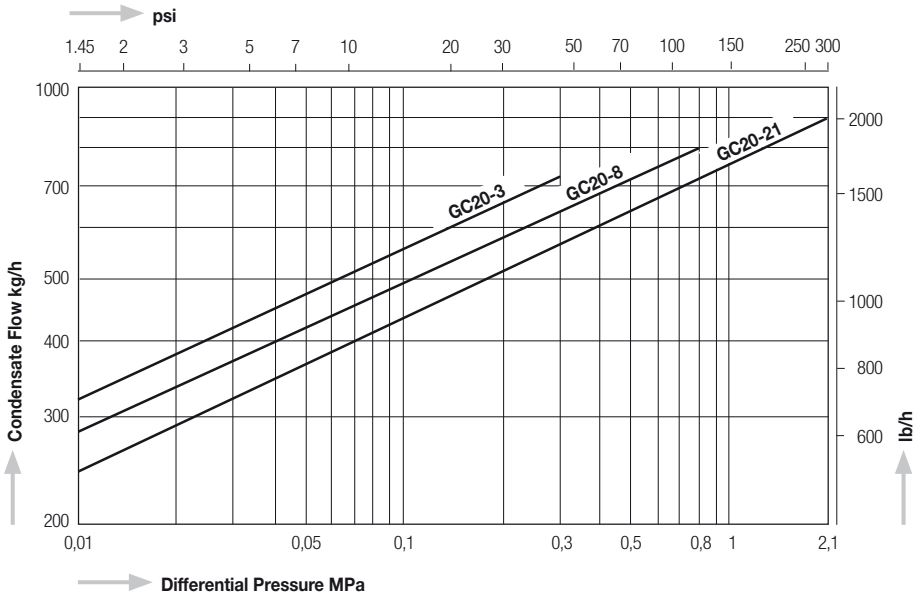
Screwed



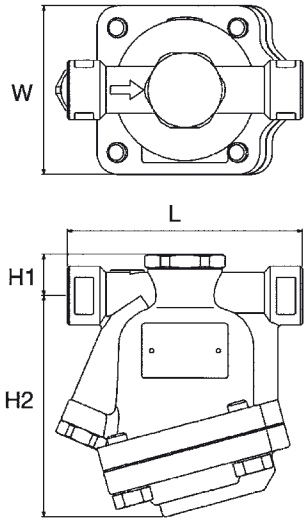
Flanged Connection

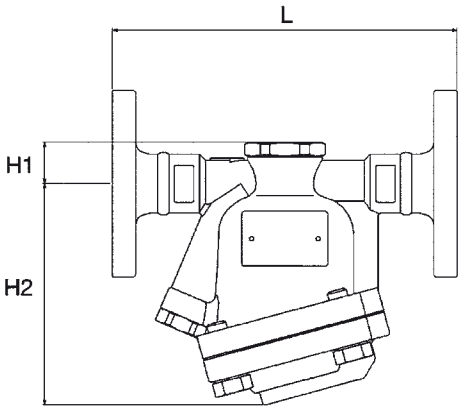
Max. allowable pressure (PMA) = 2,1 MPa (305 psig)
Max. allowable temperature (TMA) = 220°C (428°F)

Capacity Chart **GC20**



Dimensions





Available versions **GC20**

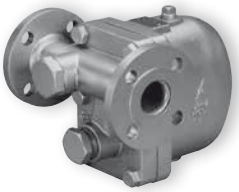
Model		Max. Operating Pressure	
		MPa	psig
GC20 -	**3**	0,3	43
GC20 -	**8**	0,8	116
GC20 -	**21**	2,1	305

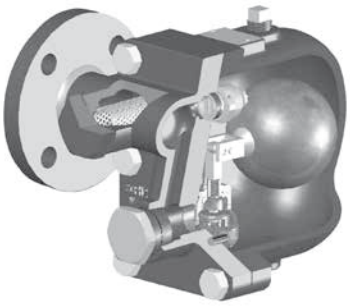
Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
GC20	Screwed Rc, NPT	1/2 ¨	2,1	305	220	428	120	21	113	86	4.7	0.8	6.4	3.4	Stainless Steel SCS13A	2,4	5.3
		3/4 ¨														2,4	5.3
		1 ¨														2,5	5.5
GC20F	Flanged JIS, ASME	1/2 ¨					175	21	113	86	6.9	0.8	4.4	3.4		3,9*	8.6*
		3/4 ¨					195				7.7					5,0*	11.0*
		1 ¨					215				8.5					5,8*	12.8*
	Flanged DIN	DN 15					150	21	113	86	5.9	0.8	4.4	3.4		3,4	7.5
		DN 20					150				5.9					3,9	8.6
		DN 25					160				6.3					4,6	10.1

***Depending on the flange rating the weight may differ**

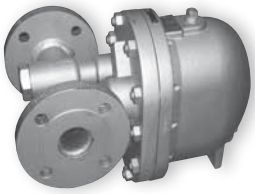
SERIES G Ball Float Trap

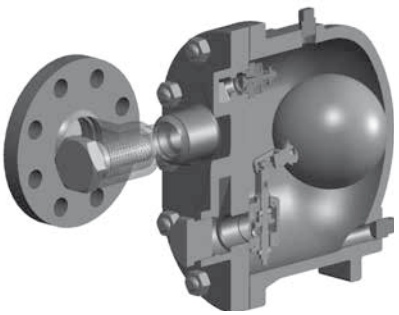
GH40



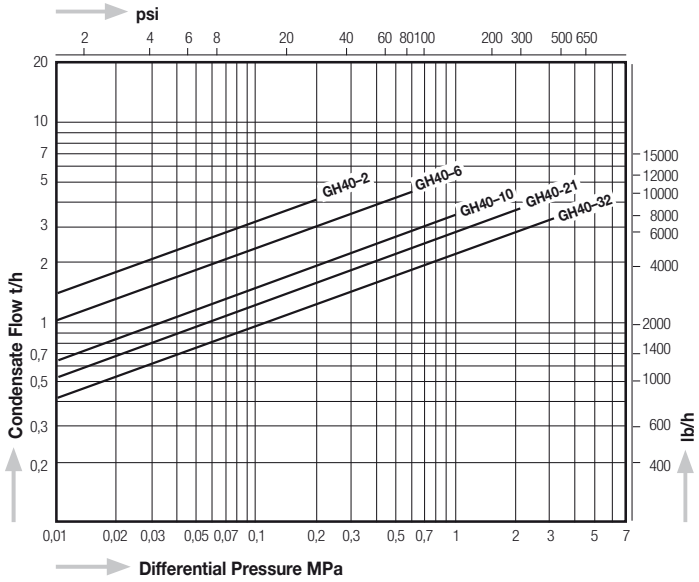


GH50

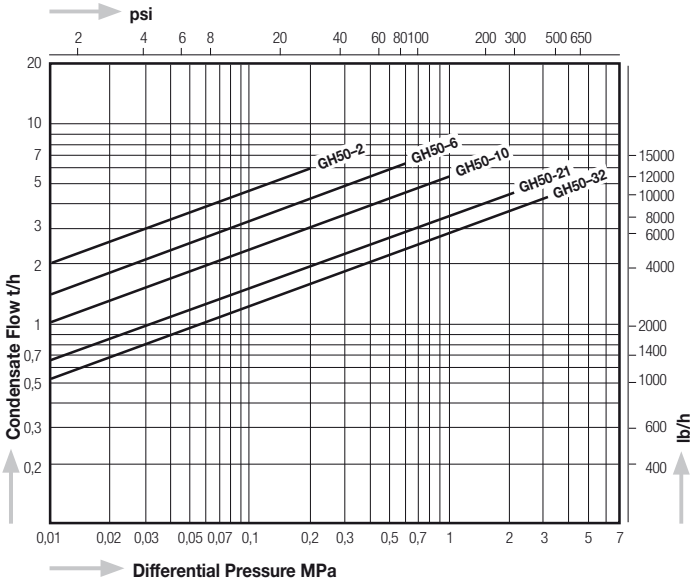




Capacity Chart **GH40**

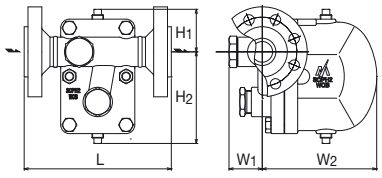


Capacity Chart **GH50**

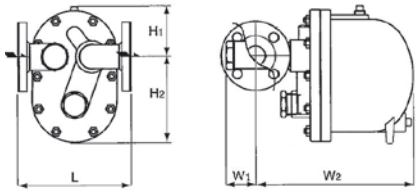


Dimensions

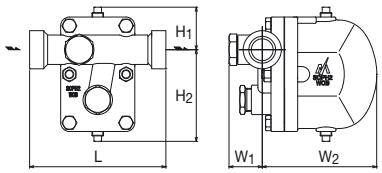
GH40-F



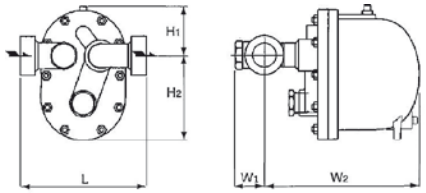
GH50-F



GH40-W



GH50-W

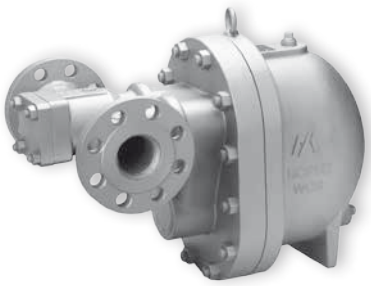


Model	Connections	Size (in)	Max. Operating Pressure, PMO		Max. Operating Temperature, TMO		Dimensions (mm)					Dimensions (in)					Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	W_1	W_2	L	H_1	H_2	W_1	W_2		kg	lb
GH40 - F	Flanged JIS, ASME, DIN	1½", 2"	0,2 – 3,2	29 – 464	400	752	230	80	170	60	210	9.1	3.15	6.7	2.4	8.3	Cast Steel SCPH2	24	53
GH40 - W	Socket Weld JIS, ASME, DIN	1½"					250	80	170	60	210	9.8	3.15	6.7	2.4	8.3		19	41.9
		2"					260					10.2							
GH50 - F	Flanged JIS, ASME, DIN	1½", 2"					230	107	173	60	330	9.1	4.2	6.8	2.4	13.0		37	81.4
GH50 - W	Socket Weld JIS, ASME, DIN	1½"					250	107	173	60	330	9.8	4.2	6.8	2.4	13.0		32	70.4
		2"					260					10.2							

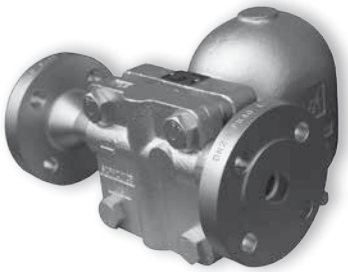
Available pressure ranges	Max. Operating Pressure (PMO)									
	MPa	psig	MPa	psig	MPa	psig	MPa	psig	MPa	psig
	0,2	29	0,6	87	1,0	145	2,1	305	3,2	464
Models	GH40-2F GH40-2W GH50-2F GH50-2W		GH40-6F GH40-6W GH50-6F GH50-6W		GH40-10F GH40-10W GH50-10F GH50-10W		GH40-21F GH40-21W GH50-21F GH50-21W		GH40-32F GH40-32W GH50-32F GH50-32W	

Depending on the flange standard the dimensions and the weight may differ.

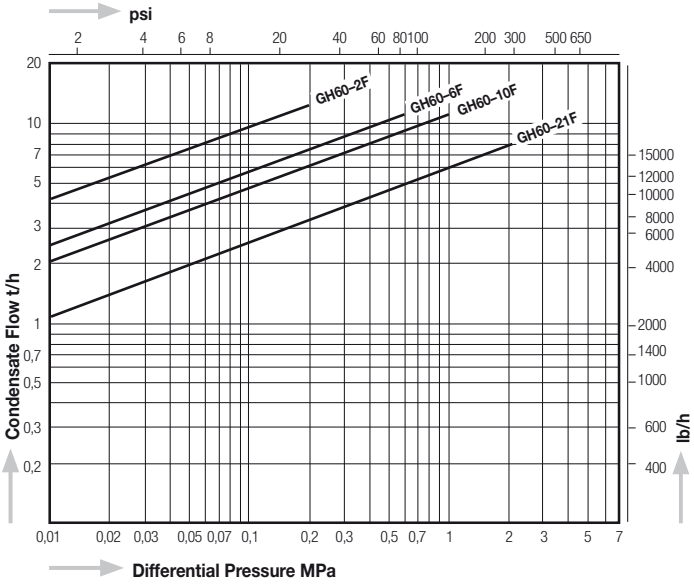
GH60



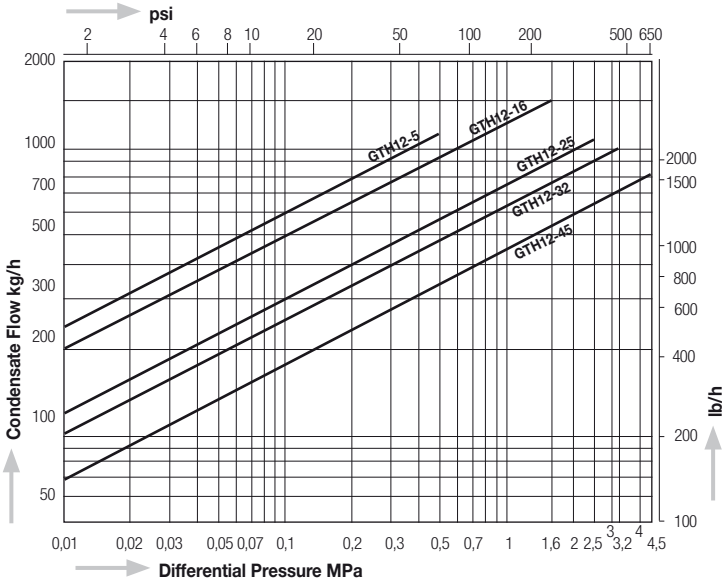
GTH12



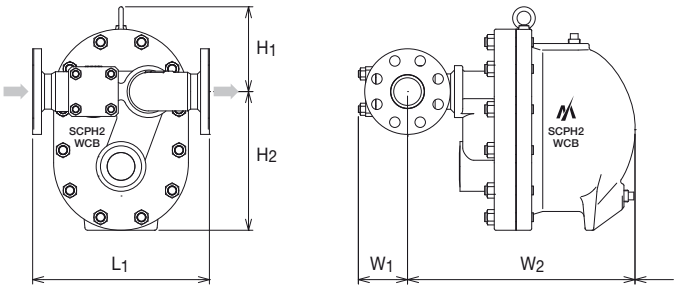
Capacity Chart **GH60**



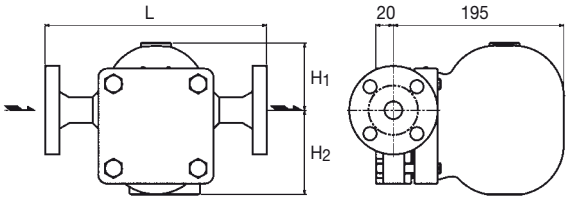
Capacity Chart **GTH12**



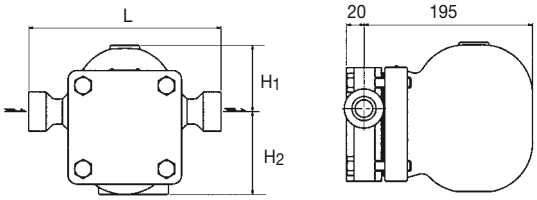
Dimensions **GH60**



Dimensions **GTH12-F Flanged**



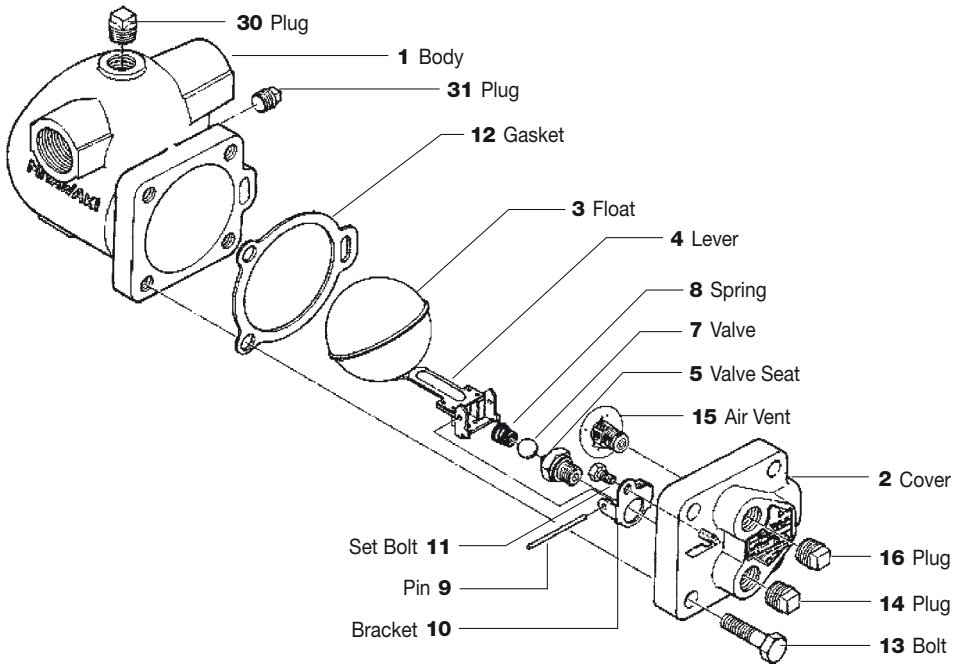
GTH12-W Socket Weld



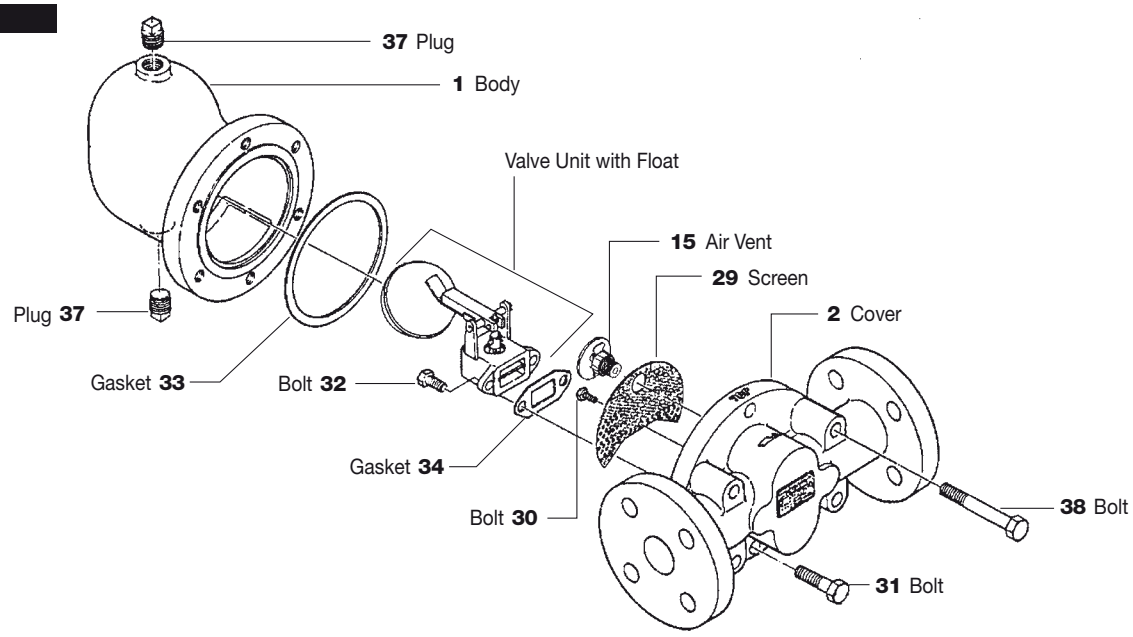
Model	Connections	Size in	Max. Operating Pressure, PMO		Max. Differential Pressure, PMX		Max. Operating Temperature, TMO		Dimensions (mm)						Dimensions (in)						Body Material	Weight	
			MPa	psig	MPa	psig	°C	°F	L	L_1	H_1	H_2	W_1	W_2	L	L_1	H_1	H_2	W_1	W_2		kg	lb
GH60 -2F	Flanged JIS, ASME, DIN	2" – 2½"	0,2	29	0,2	29	400	752		320	155	250	90	410		12.6	6.1	9.8	3.5	16.1	Cast Steel SCPH2	75	165
GH60 -6F			0,6	87	0,6	87																	
GH60 -10F			1,0	145	1,0	145																	
GH60 -21F			2,1	305	2,1	305																	
GTH12 -5F	Flanged JIS, ASME, DIN	¾", 1"	3,2	464	0,5	73	400	752	250		75	95			9.8		3.0	3.7			Cast Steel SCPH2	~14	~31
GTH12 -16F		½" – 1"			1,6	230																	
GTH12 -25F					2,5	360																	
GTH12 -32F					3,2	464																	
GTH12 -45F			5,0	725	4,5	652	425	800															
GTH12 -5W	Socket Weld JIS, ASME, DIN	¾", 1"	3,2	464	0,5	73	400	752	220		75	95			8.7		3.0	3.7			Cast Steel SCPH2	~11,5	~25.3
GTH12 -16W		½" – 1"			1,6	230																	
GTH12 -25W					2,5	360																	
GTH12 -32W					3,2	464																	
GTH12 -45W			5,0	725	4,5	652	425	800															

SERIES G Spare Parts

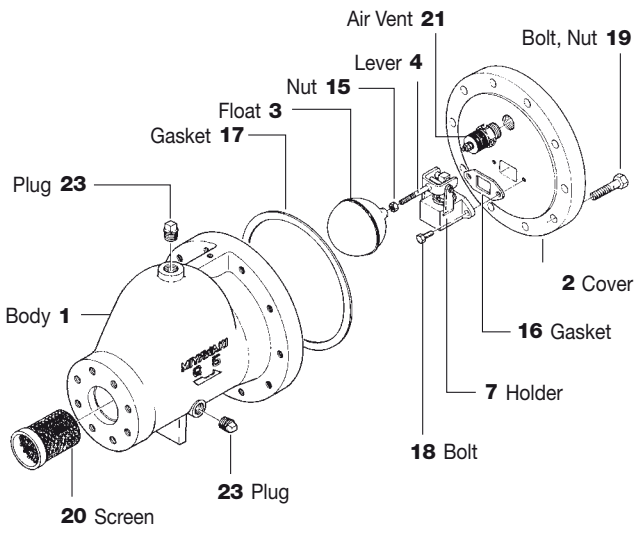
G11N/G12N



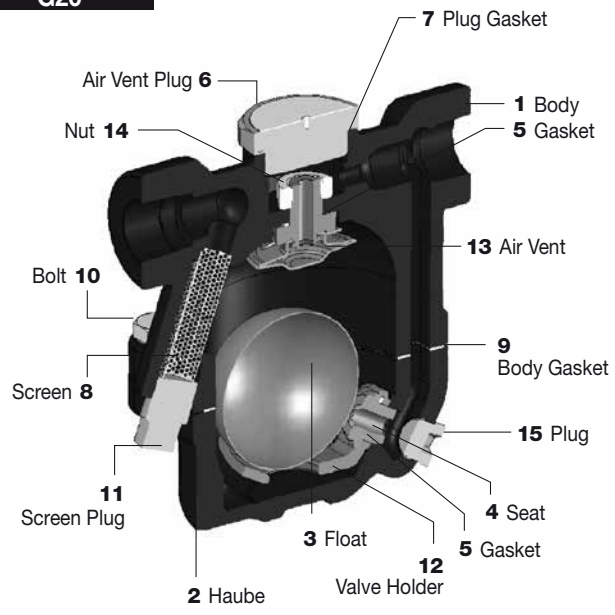
G15N



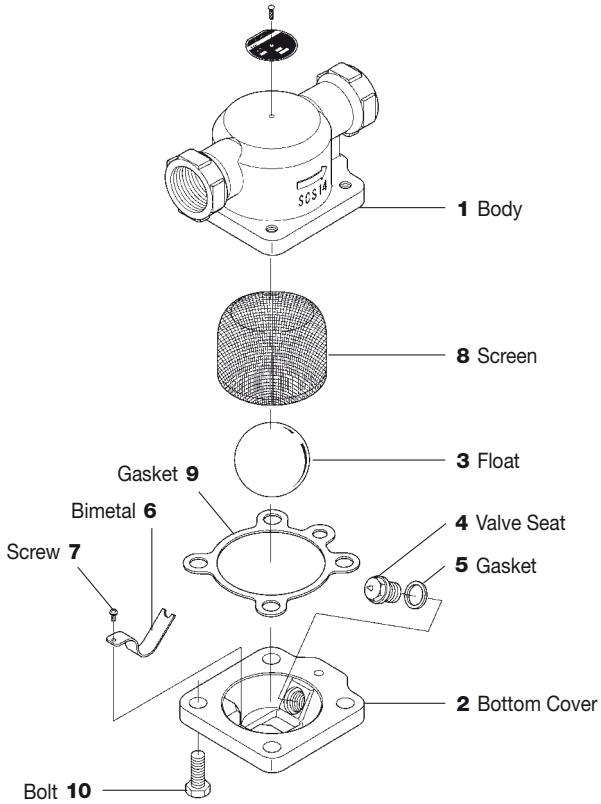
G3N, GH3N, G5, GH5



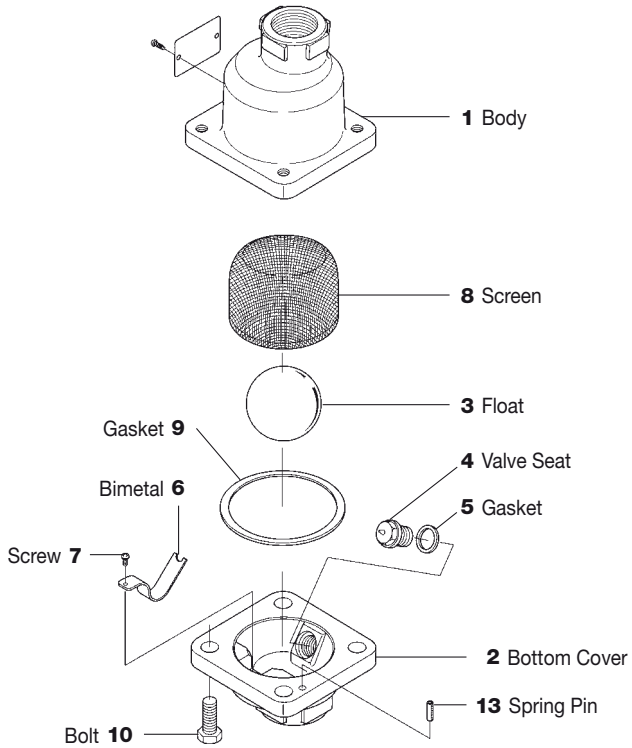
G20



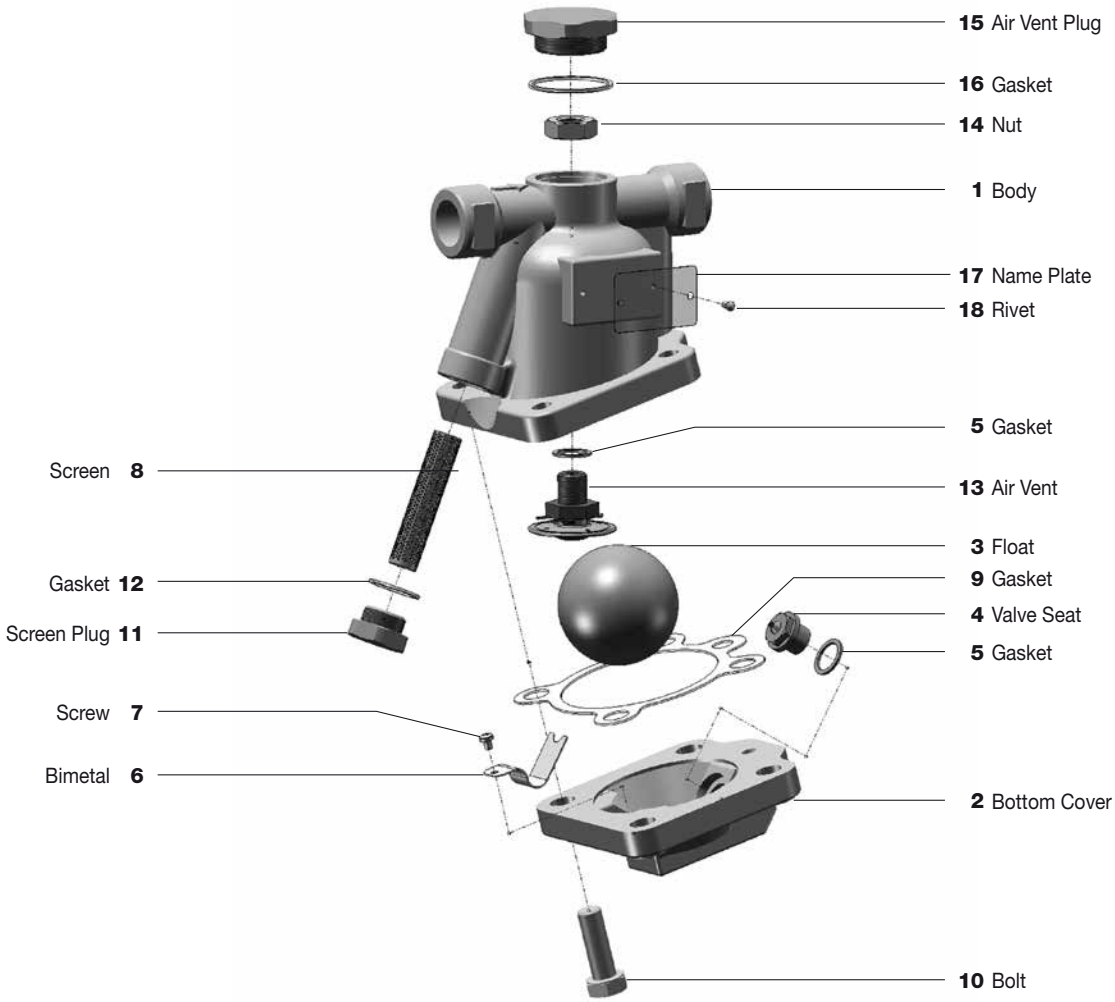
GC1



GC1V



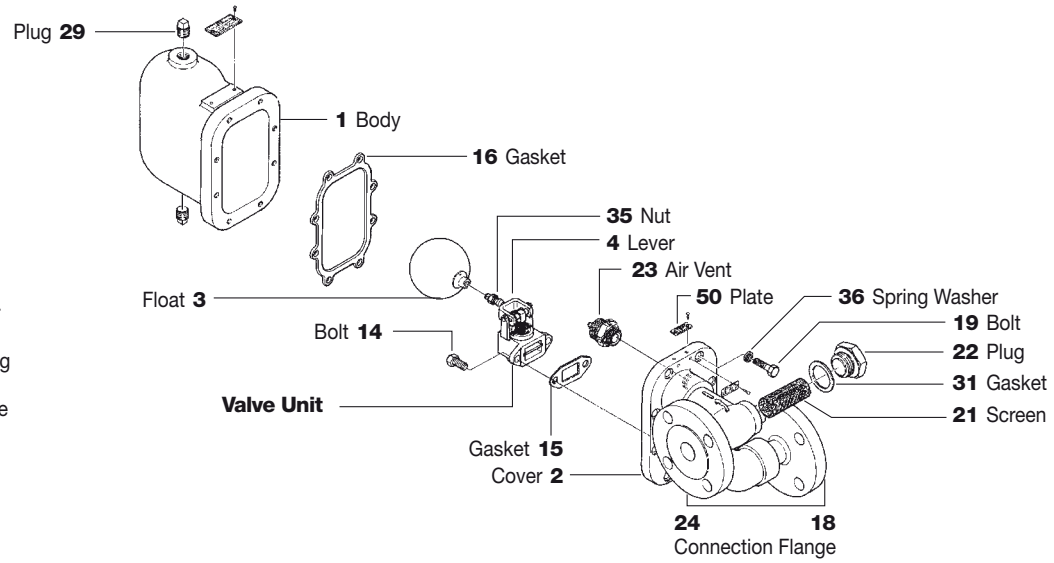
GC20



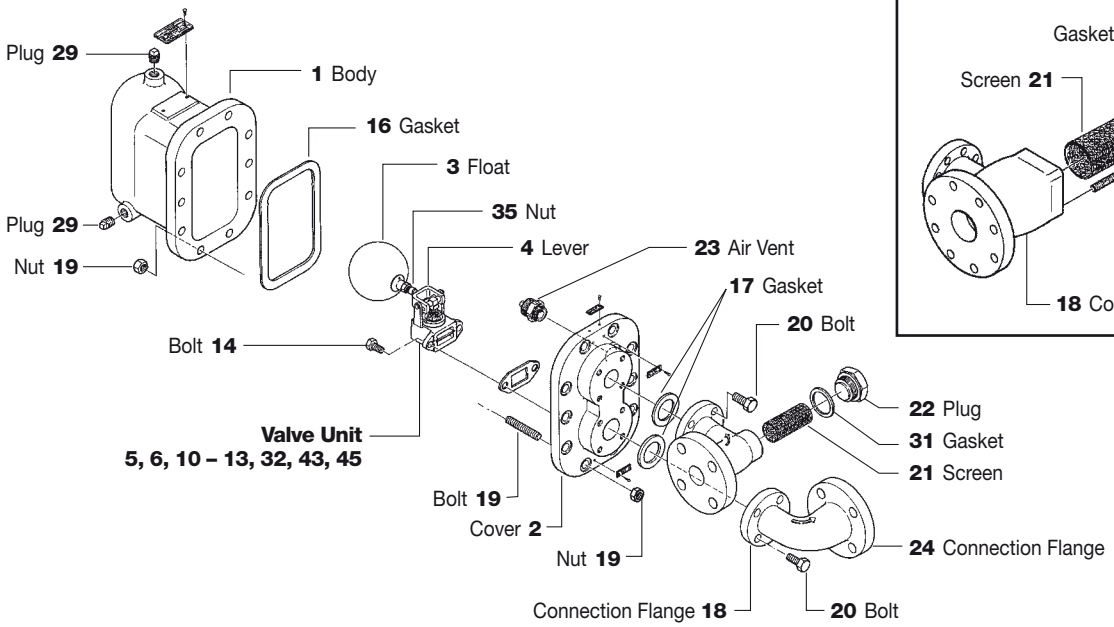
SERIES G Spare Parts

GH2

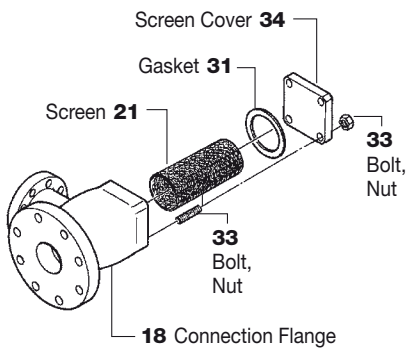
Valve Unit
- **5** Valve Seat
- **6** Valve
- **7** Holder
- **8** Lever Nut
- **9** Nut
- **10** Connector
- **11** Nut
- **12** Guide Wing
- **13** Pin
- **32** Baffle Plate
- **39** Pin
- **43** Shaft
- **44** Collar
- **45** Split Pin
- **47** Spring Pin



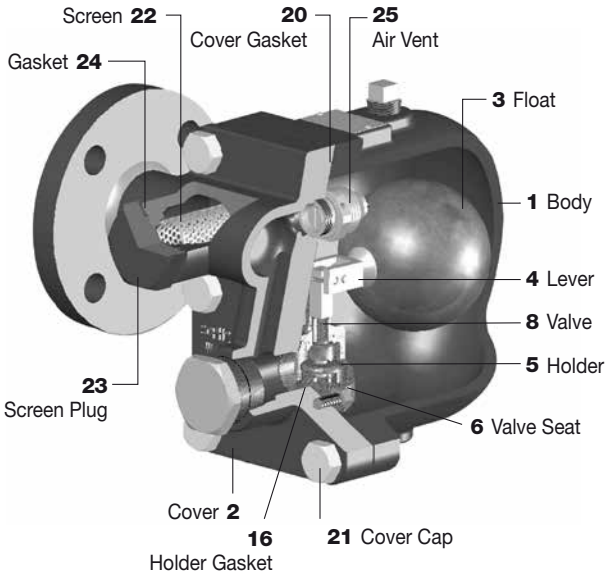
GH4, GH6, GH8



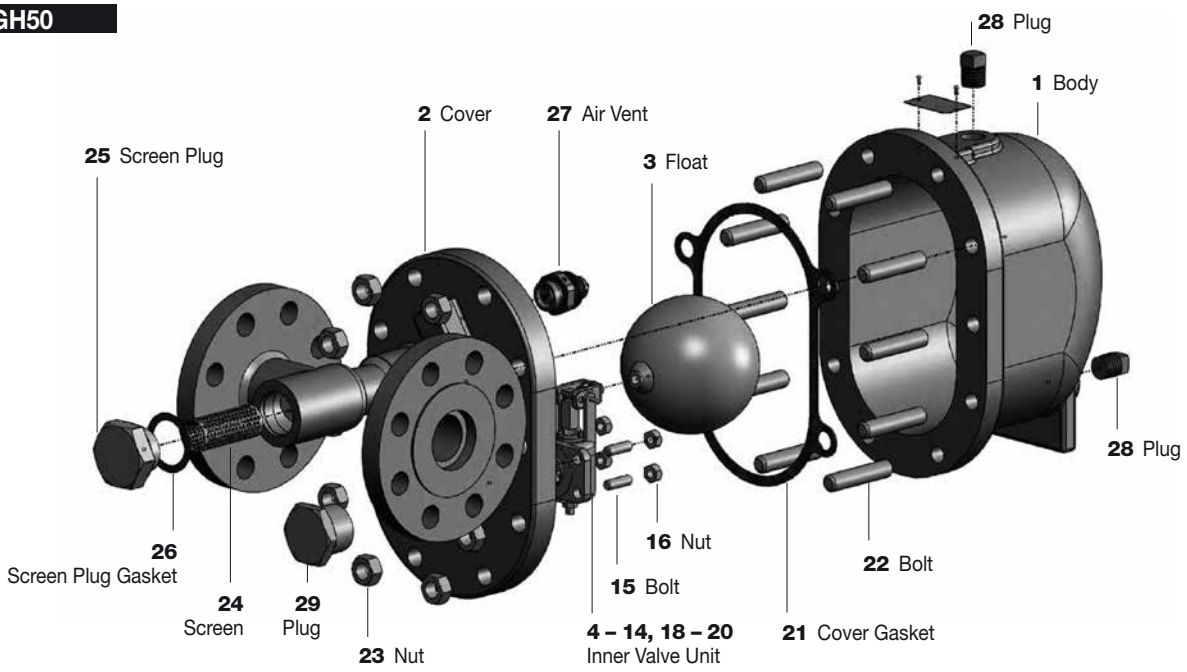
GH8 only



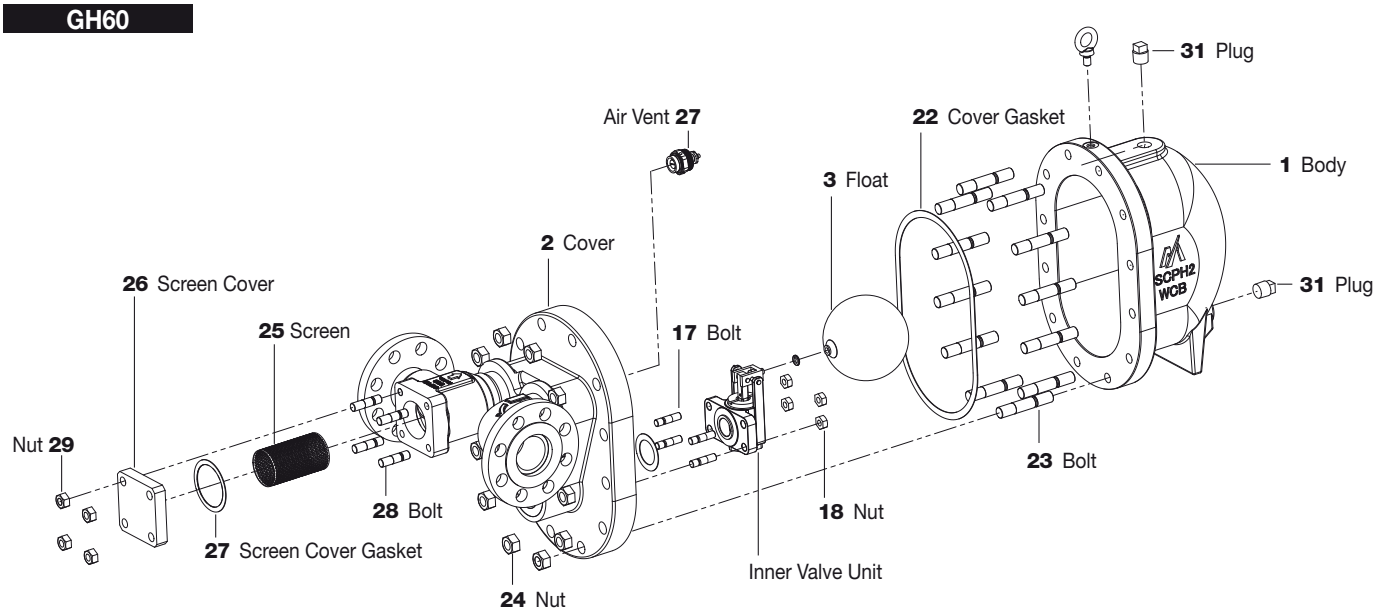
GH40



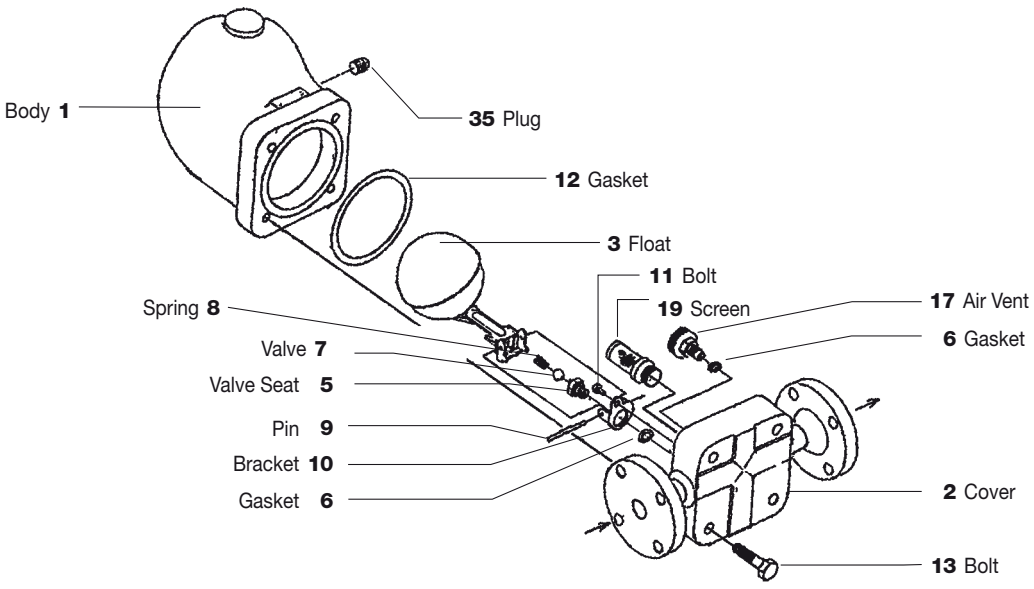
GH50



GH60



GTH12



Steam Traps with Two-bolt Connection

DC1-21U

Balanced Pressure Thermostatic Type

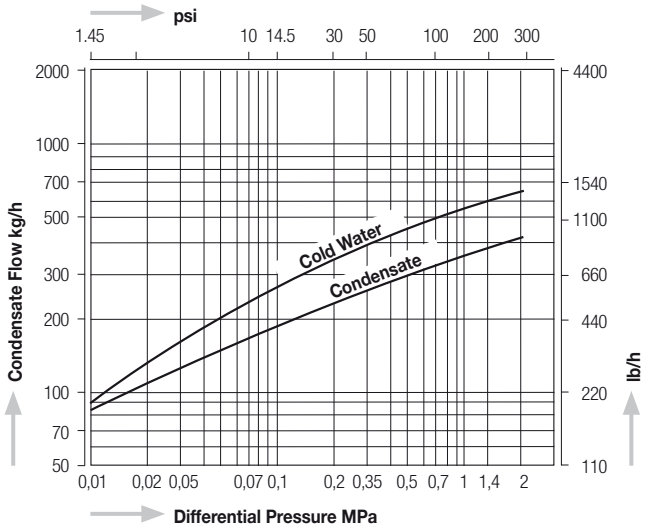
SU2-32U

Thermodynamic Type

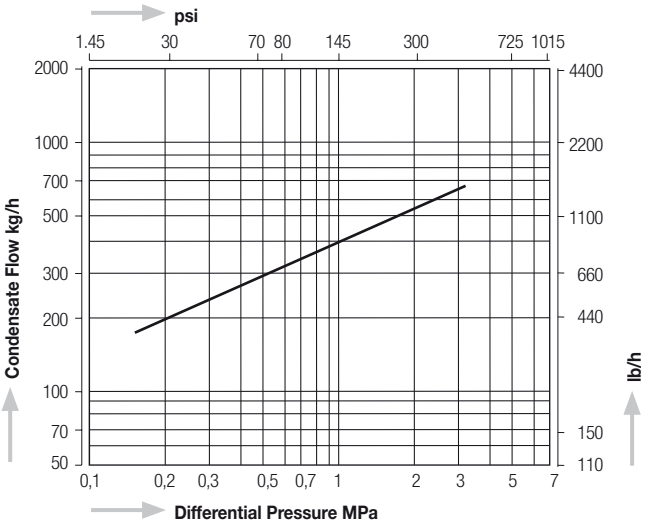
All types:

With stainless steel body and stainless steel internals. For horizontal and vertical installation. Two-bolt connection for simplified replacement of the steam trap.

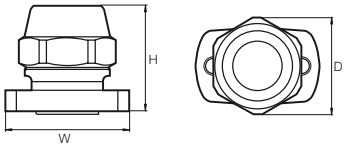
Capacity Chart **DC1-21U**



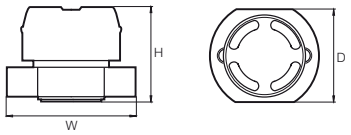
Capacity Chart **SU2-32U**



Dimensions



Dimensions



Model	Connection	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)			Dimensions (in)			Body Material	Weight	
		MPa	psig	°C	°F	D	H	W	D	H	W		kg	lb
DC1-21U	Universal Two-bolt Connection	2,1	305	235	455	55	62	70	2.2	2.4	2.8	Stainless Steel CF8M	0,8	1.8
SU2-32U		3,2	464	350	662	60	55	70	2.4	2.2	2.8	Stainless Steel SUS420J2	0,8	1.8

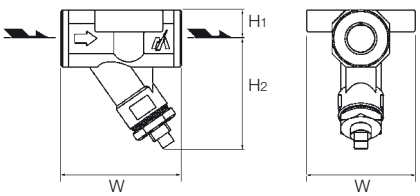
UNC

Connector Body for Models: DC1-21U & SU2-32U

Screwed

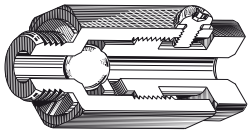
with Blow-down Valve

Dimensions

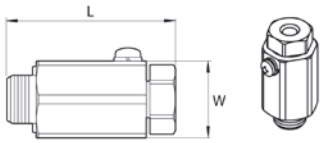


VB1, VB1R

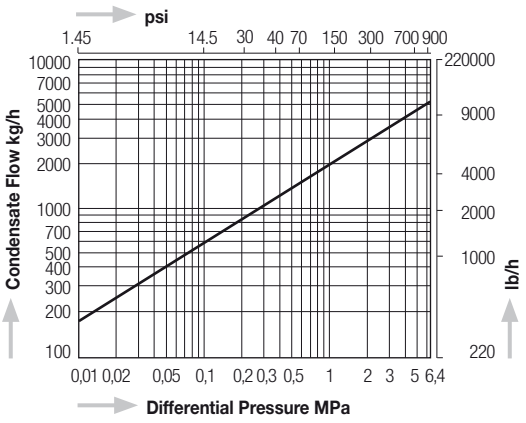
Blow-down Valve



Dimensions



Capacity Chart



Model	Connection	Size in	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	L	H1	H2	W	L	H1	H2	W		kg	lb
UNC **UNC-W**	Screwed & Socket Weld	½" ¾"	3,2	464	400	752	80	19	73	72	3.15	0.75	2.9	2.8	Stainless Steel A351CF8M	1,0	2.2
VB1	Screwed G	¼"	6,4	928	425	800	46			25	1.8			1.0	Stainless Steel SUS304	0,08	0.18
VB1R	Screwed R						50				2.0						

Air Traps and Air Vents

SERIES A

MIYAWAKI **Air Traps** are designed for continuous discharge of condensate from air piping, receiver tanks, gas and compressed air systems.

Depending on the operating conditions and applications a wide range of various types of air traps is available. Most of the traps can be fitted with a pressure – balancing line to ensure air can escape from the trap body to prevent air locking. Pressure-balancing lines are usually not necessary, if the air trap is installed directly below the equipment to be drained or if the trap is installed vertically.

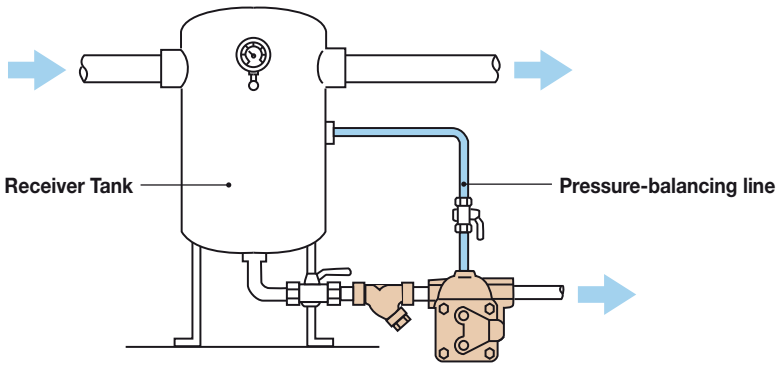
MIYAWAKI offers different seat materials and various body materials (including stainless steel) for draining special gas applications.

MIYAWAKI **Air Vents** are designed for pipe lines or industrial equipment to remove troublesome air automatically from them.

Types

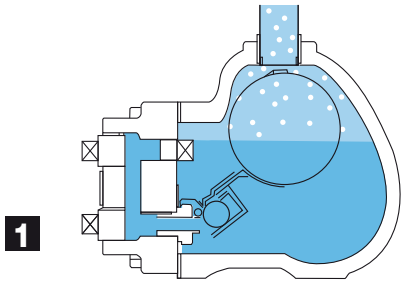
Air Traps	**AG11/AG12**	Cast iron ball float air traps for medium condensate amounts
	AGC1V	Stainless steel ball float air trap for small condensate loads (vertical installation)
	AG29	Ductile cast iron ball float air and gas trap
	AGH29	Cast steel ball float air and gas trap
	AGU29	Stainless steel ball float air and gas trap
	AGH12, AGH50	Cast Steel ball float air and gas trap
	AE8	Ductile cast iron inverted bucket air trap
	AV	Cast iron thermodynamic air trap with incorporated bypass
Air Vents	**AW**	Thermostatic air vents made of brass
	AT9	Forged steel thermostatic bimetallic air vents

Installation Example

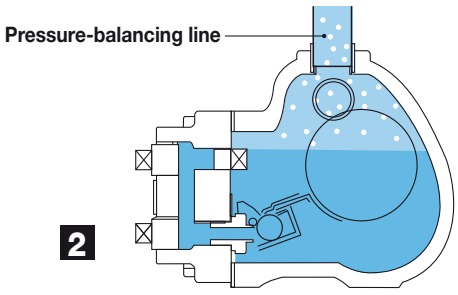


Operating principle

cold condensate air

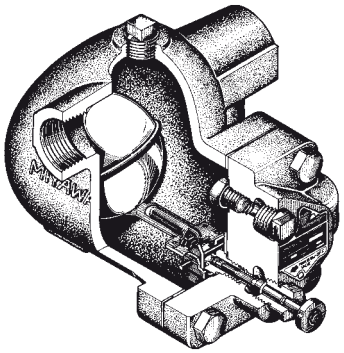


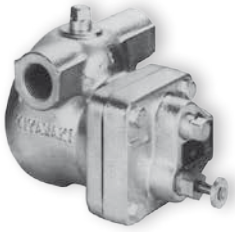
At start up condensate enters the air trap. The float is rising and the condensate will be discharged through the wide open valve.
Air, which usually enters the trap body together with the condensate, will accumulate in the upper part of the trap body. To prevent air locking, a pressure-balancing line connects the upper part of the trap with the drained equipment, so that the air can escape easily from the trap body.



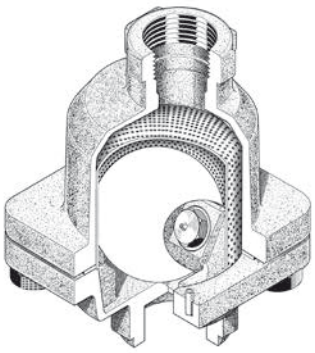
Condensate continuously enters the air trap. Depending on the condensate amount the float will move upwards or downwards to open or close the valve seat. Usually a certain liquid level will be maintained in the trap body and condensate will be discharged continuously. Air will leave the trap body through the pressure-balancing line.

AG11, AG12

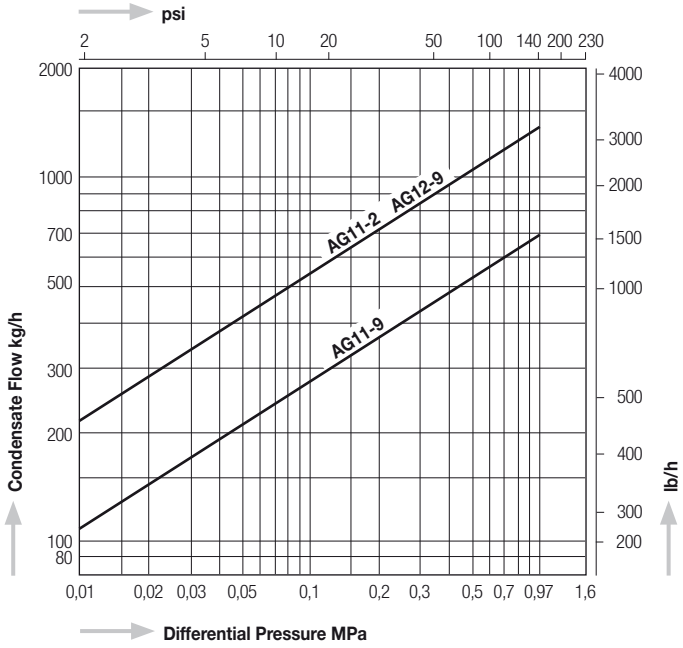




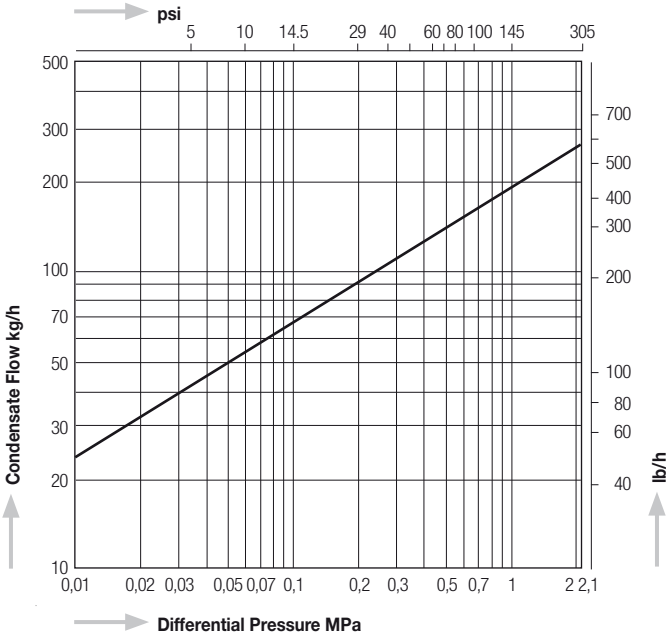
AGC1V



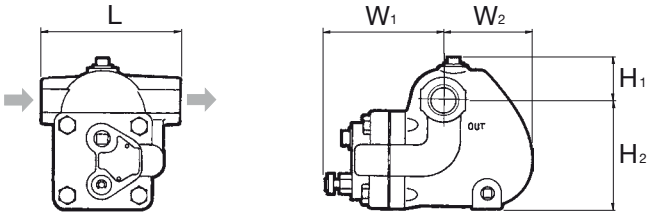
Capacity Chart **AG11, AG12**



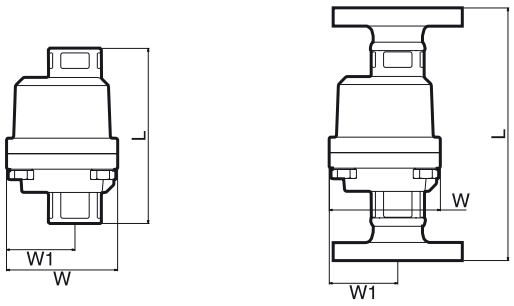
Capacity Chart **AGC1V**



Dimensions **AG11, AG12**

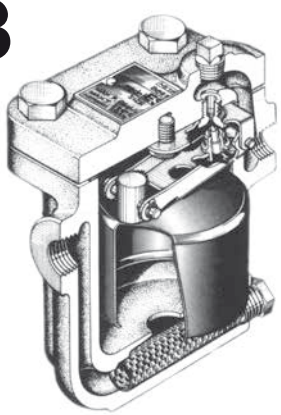


Dimensions **AGC1V, AGC1V-W, AGC1V-F**

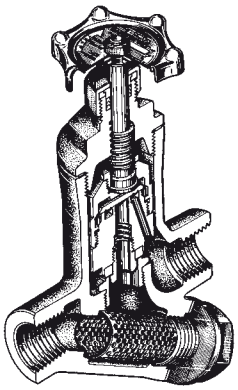


Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)						Dimensions (in)						Body Material	Weight	
			MPa	psig	°C	°F	L	H_1	H_2	W_1	W_2	W	L	H_1	H_2	W_1	W_2	W		kg	lb
AG11 - 2	Screwed Rc, NPT	½¨, ¾¨	0,01 – 0,2	1.5 – 29	100	212	120	37	92	121	60	–	4.7	1.5	3.6	4.8	2.4	–	Cast Iron FC250	3,9	8.6
AG11 - 9			0,01 – 0,97	1.5 – 140																	
AG12 - 9		¾¨, 1¨	0,01 – 0,97	1.5 – 140			140	47	113	129	92		5.5	1.9	4.4	5.1	3.6			5,9	13.0
AGC1V	Screwed Rc, NPT	½¨	0,01 – 2,1	1.5 – 305	350	662	127	–	–	53	–	86	5.0	–	–	2.1	–	3.4	Stainless Steel SCS14	1,8	4.0
		¾¨					136						5.4							1,9	4.2
		1¨					140			51			5.5			2.0				2,0	4.4
AGC1V-W	Socket Weld JIS, ASME, DIN	½¨	0,01 – 2,1	1.5 – 305	350	662	127	–	–	53	–	86	5.0	–	–	2.1	–	3.4		1,8	4.0
		¾¨					136						5.4							1,9	4.2
		1¨					140			51			5.5			2.0				2,0	4.4
AGC1V-F	Flanged JIS, ASME, DIN	½¨	0,01 – 2,1	1.5 – 305	350	662	175	–	–	53	–	86	6.9	–	–	2.1	–	3.4		3,3	7.3
		¾¨					195						7.7							4,5	9.9
		1¨					215			51			8.5			2.0				5,3	11.7

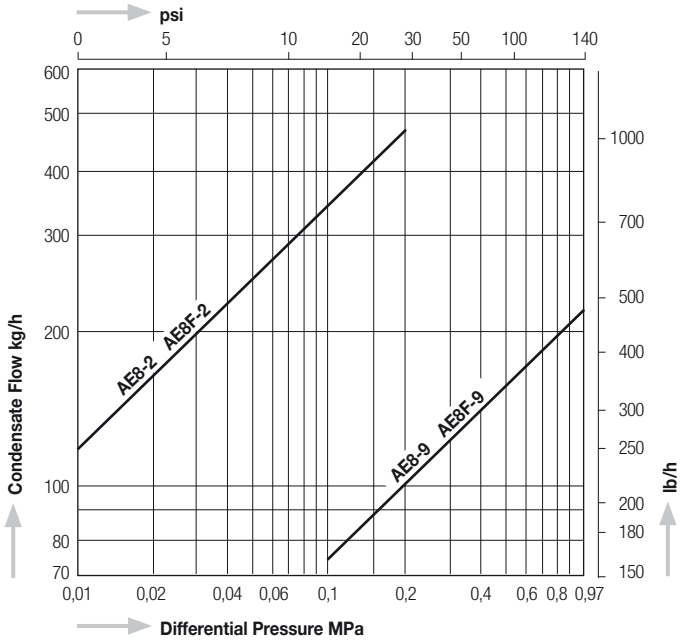
AE8



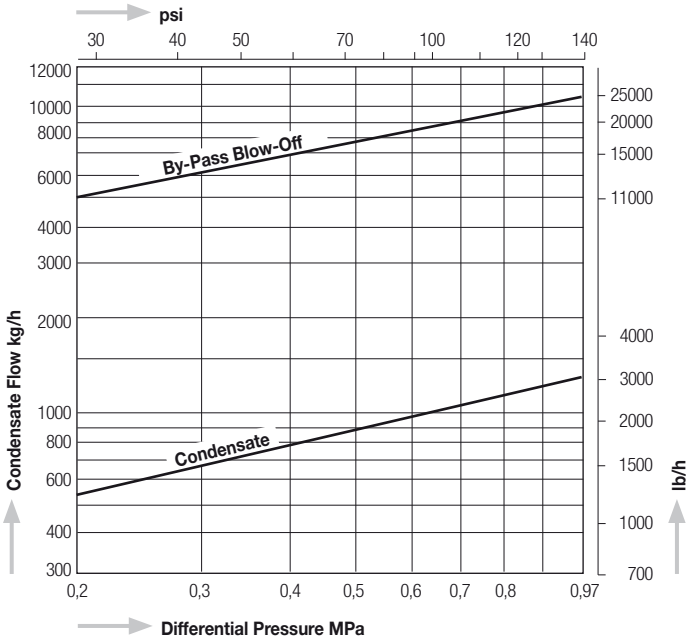
AV



Capacity Chart **AE8**

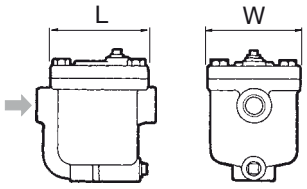


Capacity Chart **AV**

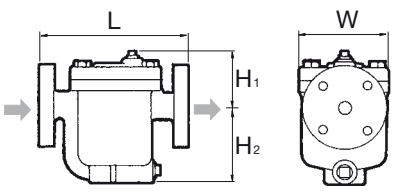


Dimensions

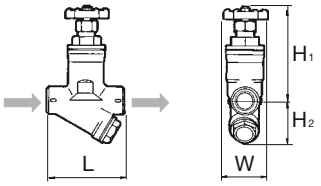
AE8



AE8F

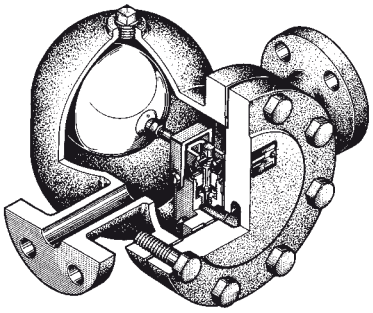


AV

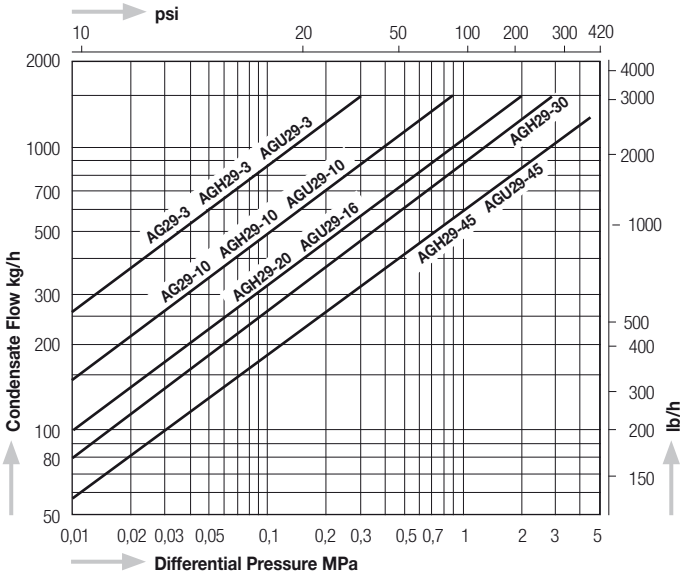


Model		Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
				MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
AE8-	2	Screwed Rc, NPT	½"	0,01 – 0,2	1.5 – 29	350	662	130	73	90	100	5.1	2.9	3.5	3.9	Ductile Cast Iron FCD450	3,7	8.1
			¾"															
			1"					135				5.3					3,9	8.6
	9		½"	0,1 – 0,97	1.5 – 140			130	73	90	100	5.1	2.9	3.5	3.9		3,7	8.1
			¾"															
			1"					135				5.3					3,9	8.6
AE8F-	2	Flanged JIS, ASME, DIN	½"	0,01 – 0,2	1.5 – 29	350	662	175	73	90	100	6.9	2.9	3.5	3.9		5,3	11.7
			¾"					195	68	95		7.7	2.7	3.7			5,7	12.5
			1"					215				8.5					6,8	15.0
	9		½"	0,1 – 0,97	1.5 – 140			175	73	90	100	6.9	2.9	3.5	3.9		5,3	11.7
			¾"					195	68	95		7.7	2.7	3.7			5,7	12.5
			1"					215				8.5					6,8	15.0
AV-4		Screwed Rc, NPT	½"	0,1 – 0,97	1.5 – 140	150	302	110	155	60	65	4.3	6.1	2.4	2.6	Cast Iron FC250	2,4	5.3
AV-6			¾"					120		65		4.7		2.6			2,5	5.5
AV-8			1"							70				2.8			2,7	5.9

AG29/AGH29

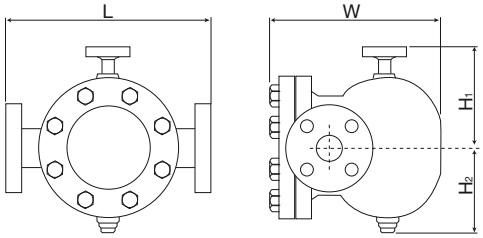


Capacity Chart AG29, AGH29, AGU29

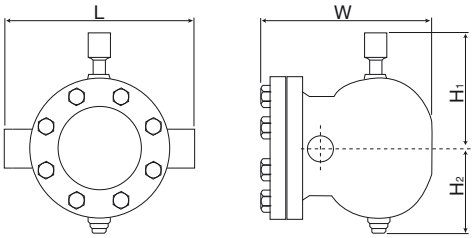


Dimensions

AG29, AGH29, AGU29



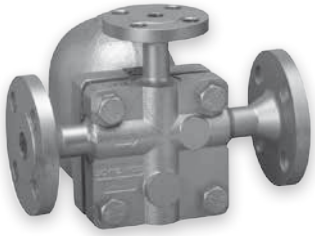
AGH29W, AGU29W



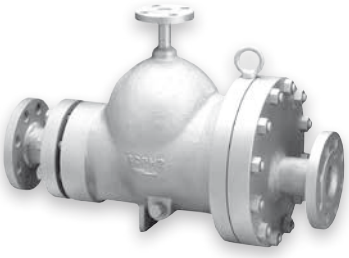
Model		Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
				MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
AG29 -	**3**	Flanged JIS, ASME, DIN	½" – 1"	0,3	43	300	572	340	200	120	260	13.4	7.9	4.7	10.2	Ductile Cast Iron FCD450	26	57.2
	10			0,97	140													
AGH29 -	**3**	Flanged JIS, ASME, DIN	½" – 2"	0,3	43	400	752	340 ½" – 1" 390 1¼" – 2"	200	120	260	13.4 ½" – 1" 15.4 1¼" – 2"	7.9	4.7	10.2	Cast Steel SCPH2	28,0* ½" – 1" 32,0* 1¼" – 2"	61.6* ½" – 1" 70.4* 1¼" – 2"
	10			1,0	145													
	20			2,0	290													
	30			2,9	420													
	45			4,5	652													
AGH29W -	**3**	Socket Weld ASME, DIN	½" – 1"	0,3	43	400	752	280	200	120	260	11.0	7.9	4.7	10.2		25,5	56.1
	10			1,0	145													
	20			2,0	290													
	30			2,9	420													
	45			4,5	652													
AGU29 -	**3**	Flanged JIS, ASME, DIN	½" – 2"	0,3	43	400	752	340 ½" – 1" 390 1¼" – 2"	200	120	260	13.4 ½" – 1" 15.4 1¼" – 2"	7.9	4.7	10.2	Stainless Steel SCS13A	28,0* ½" – 1" 32,0* 1¼" – 2"	61.6* ½" – 1" 70.4* 1¼" – 2"
	10			1,0	145													
	16			1,6	230													
	45			4,5	652													
AGU29W -	**3**	Socket Weld ASME, DIN	½" – 1"	0,3	43	400	752	280	200	120	260	11.0	7.9	4.7	10.2		25,5	56.1
	10			1,0	145													
	16			1,6	230													
	45			4,5	652													

*** The weight may differ depending on the size and flange standard.**

AGH12, AGH50

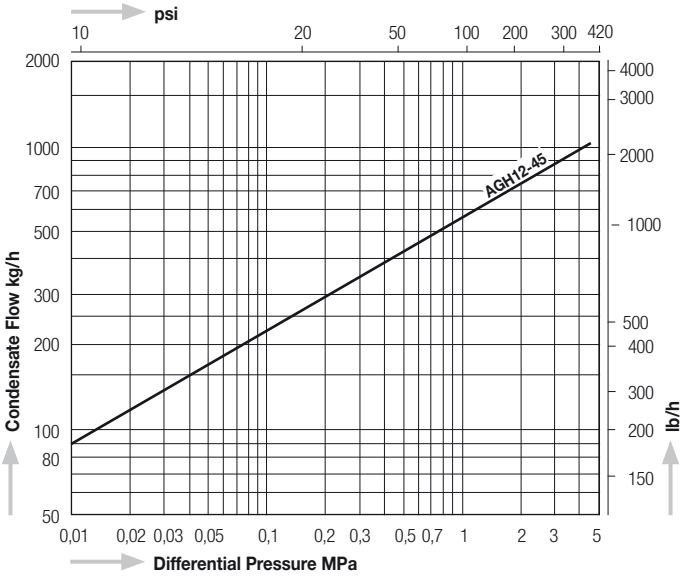


AGH12



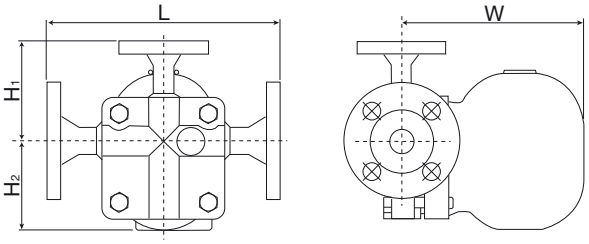
AGH50

Capacity Chart AGH12-45

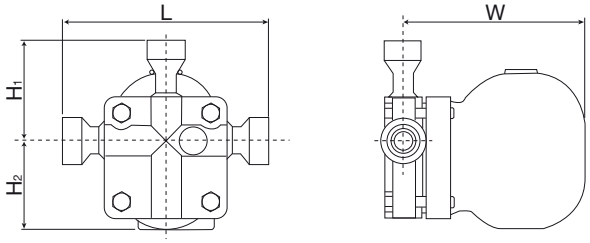


Dimensions

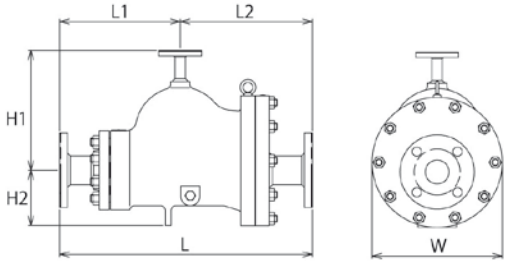
AGH12-45F



AGH12-45W



AGH50



Capacity Chart AGH50

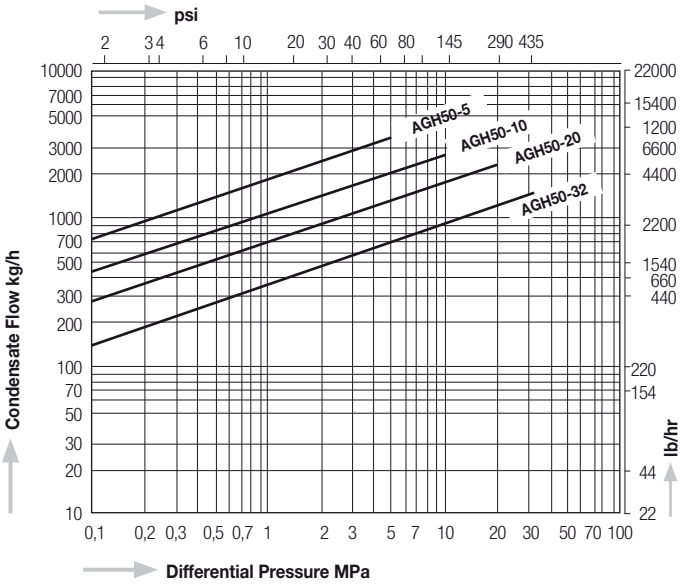


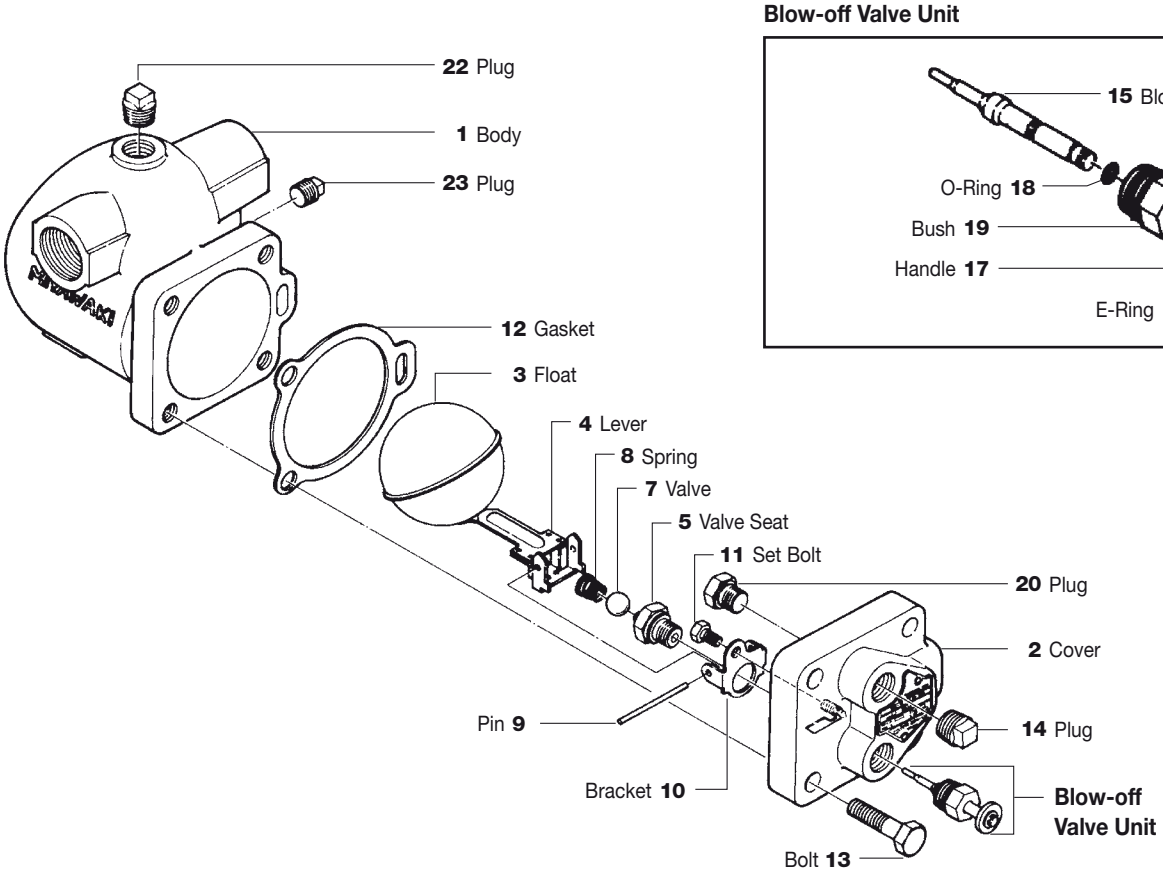
Table 1: Dimensions L and Weight

Model	Connections	ASME Class* (#150, #300)							
		Dimensions* (mm)			Dimensions* (in)			Weight*	
		L	L_1	L_2	L	L_1	L_2	kg	lb
AGH50	2¨	525	250	275	20,7	9,8	10,8	64	140,8
	2½¨	550	265	285	21,7	10,4	11,2	68	149,6
	3¨	555		290	21,9	10,4	11,4	72	158,4
	4¨	590	285	305	23,2	11,2	12,0	73/82	160,6/180,4

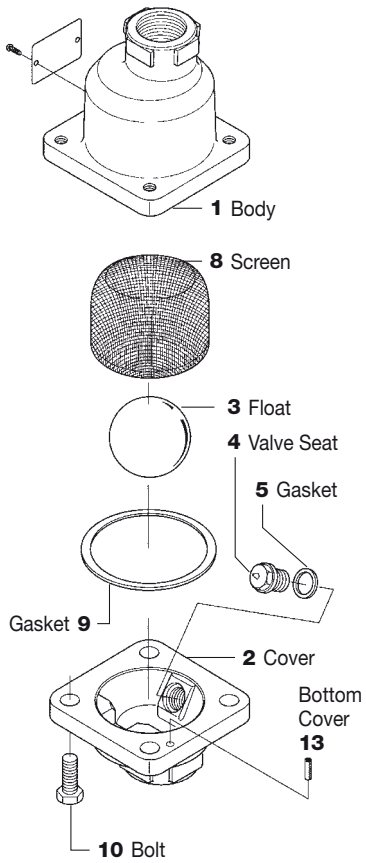
Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions* (mm)						Dimensions* (in)						Body Material	Weight*	
			MPa	psig	°C	°F	L	L_1	L_2	H_1	H_2	W	L	L_1	L_2	H_1	H_2	W		kg	lb
AGH12 - 45F	Flanged JIS, ASME, DIN	½¨ – 1¨	4,5	652	425	800	250			107	95	195	9.8			4.2	3.7	7.7	Cast Steel SCPH2	17	37.4
AGH12 - 45W	Socket Weld ASME, DIN						220			75			8.7							12	26.4
AGH50 - 5 10 20 32	Flanged JIS, ASME, DIN	2¨ – 4¨	3,2	464	400	752	Table 1			250	115	270	Table 1			9.8	4.5	10.6	Cast Steel SCPH2	Table 1	

*** Depending on the flange standard the face-to-face dimensions and the weight may differ.**

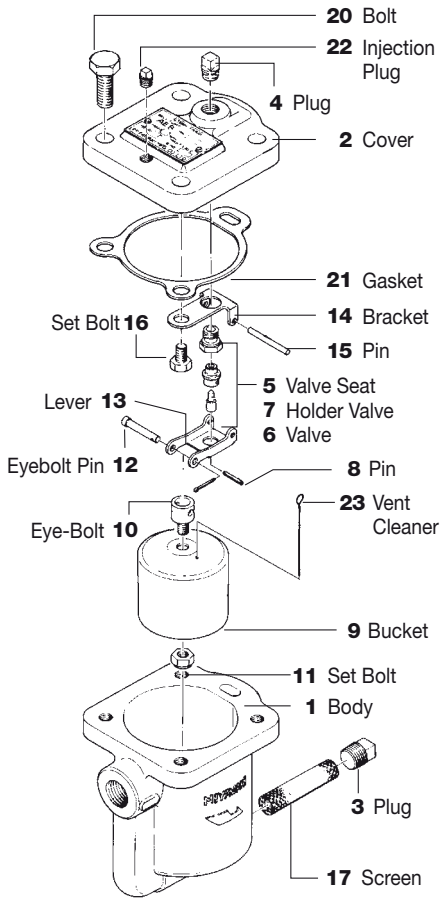
AG11/AG12



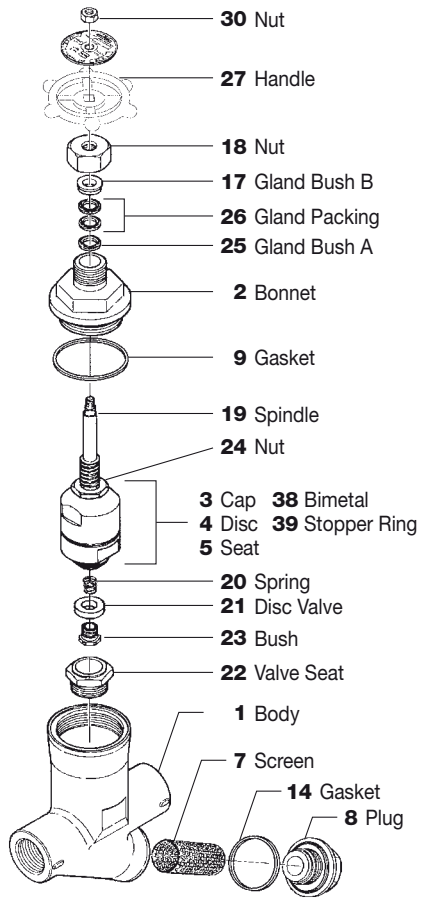
AGC1V



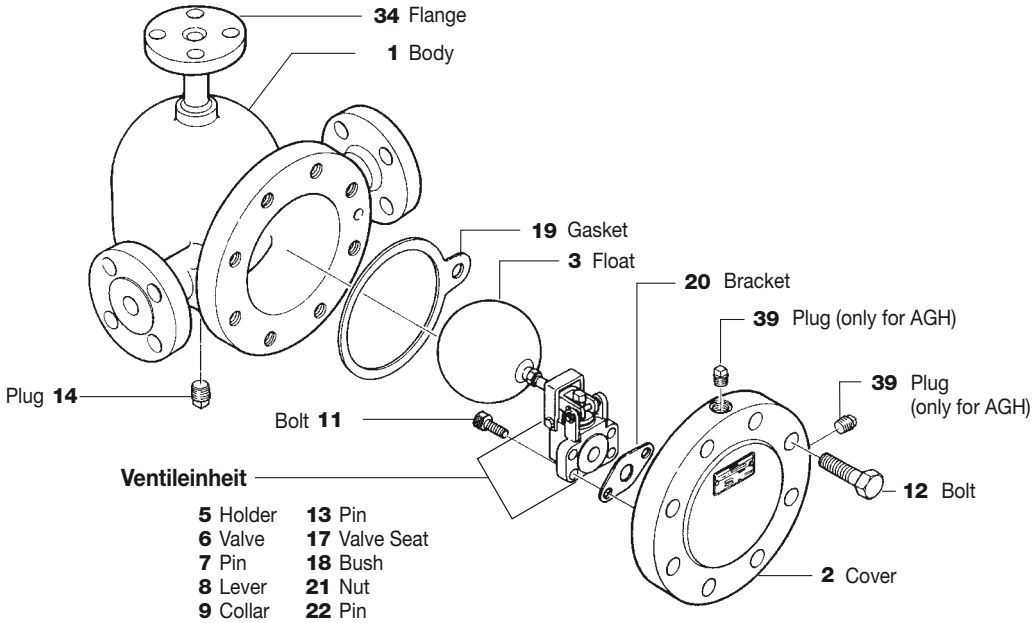
AE8



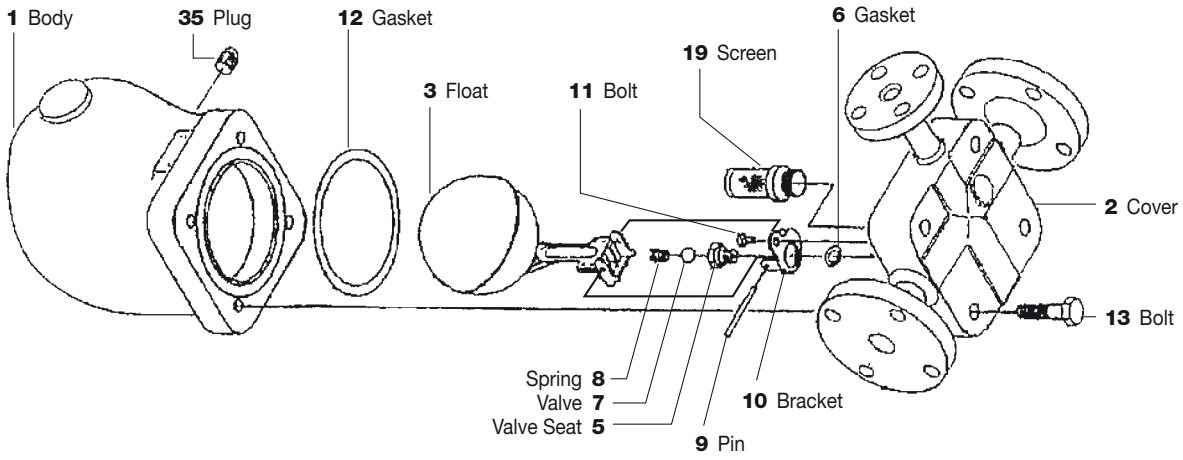
AV



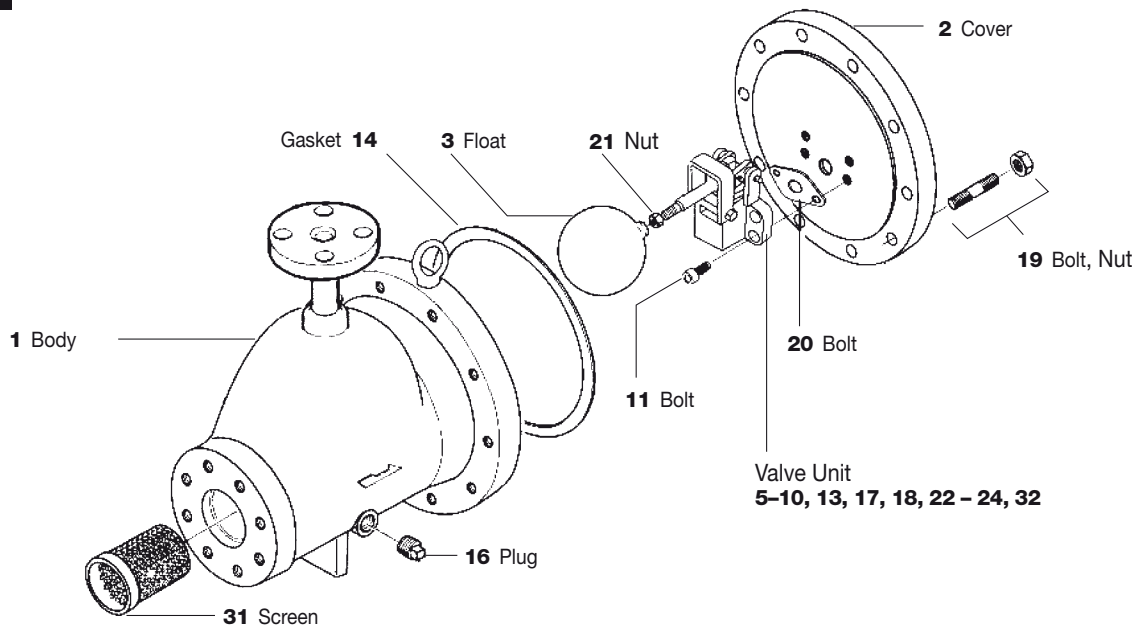
AG29



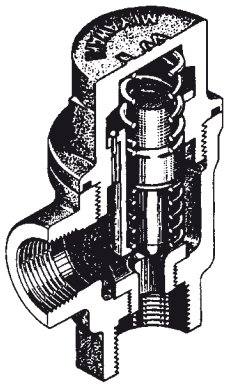
AGH12



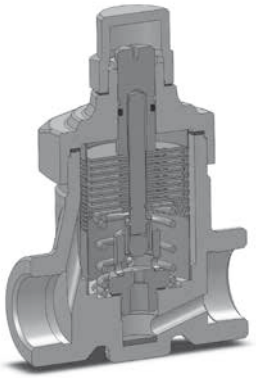
AGH50



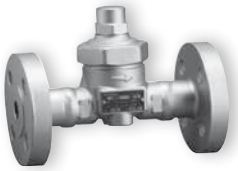
AW2



AT9N

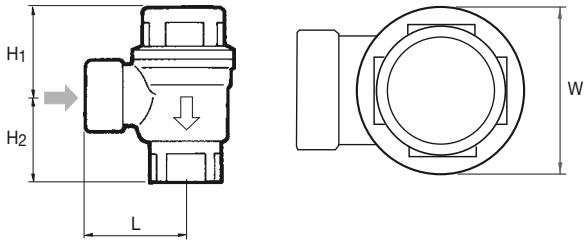


Screwed & Socket weld

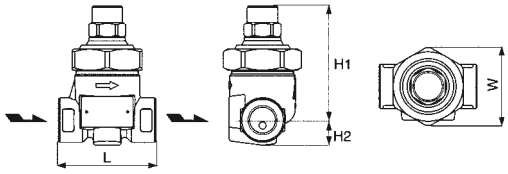


Flanged Connection

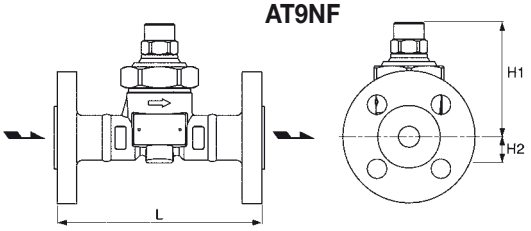
Dimensions AW2



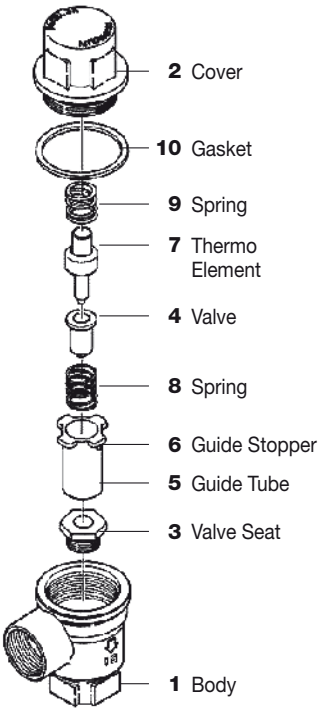
Dimensions AT9N • AT9NW



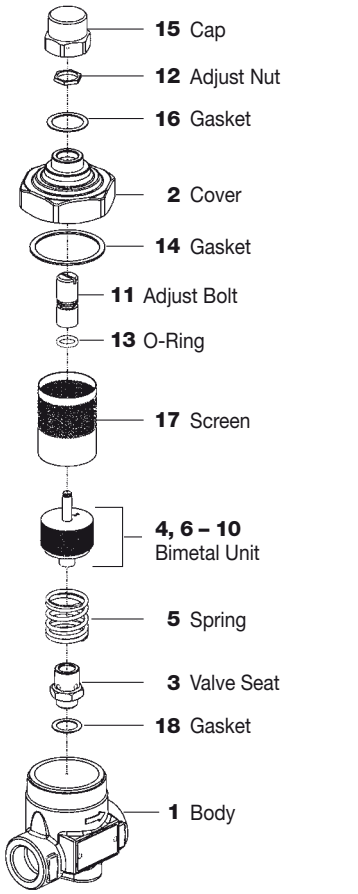
AT9NF



AW2



AT9N



Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Adjustable Range		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	°C	°F	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
AW2-5	Screwed Rc, NPT	½"	0,5	73	160	320	–	–	35	39	35	41	1.4	1.5	1.4	1.6	Brass C3771	0,4	1.0
		¾"									41				1.6			0,5	1.1
AT9N	Screwed Rc, NPT	½"	1,6	230	350	662	50 – 180	122 – 356	70	82	18	56	2.75	3.2	0.7	2.2	Forged Steel A105	0,9	2.0
		¾"							80		19		3.1		0.75			1,0	2.2
		1"									23				0.9			1,1	2.4
AT9NW	Socket Weld ASME, DIN	½"							70	82	18	56	2.75	3.2	0.7	2.2		0,9	2.0
		¾"							80		19		3.1		0.75			1,0	2.2
		1"									23				0.9			1,1	2.4
AT9NF	Flanged JIS, ASME, DIN	½"							145*	82	18	56	5.7*	3.2	0.7	2.2		2,6	5.7
		¾"									19				0.75			3,4	7.5
		1"									23				0.9			4,0	8.8

***On request also available with different face-to-face length**

Pressure Reducing Valves

SERIES RE

Pressure Reducing Valves (PRV) are designed for regulating downstream pressure and maintaining it within certain acceptable limits. Ideally, a PRV should provide constant downstream pressure while delivering the required flow, i.e. the PRV automatically adjusts the steam flow to meet the downstream system demand.

MIYAWAKI's pressure reducing valves are designed **only for steam**.

Types

MIYAWAKI is manufacturing two types of PRV:

- **Direct** acting pressure reducing valves **RE1, REC1 and RE2**
- **Pilot** operated pressure reducing valves **RE3 and RE10N**

Operating principle **General**

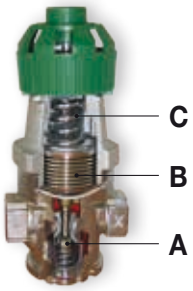
Direct Acting PRV

The direct acting PRV has 3 essential elements:

A Main Valve Unit

B Pressure Measuring Element (Bellows)

C Adjust Spring



Changes in downstream pressure are sensed by the bellows, which expands or contracts depending on the pressure change.
The movement of the bellows will be directly transferred to the spring, which will open or close the main valve, thus keeping the downstream pressure at a certain level.

Pilot Operated PRV

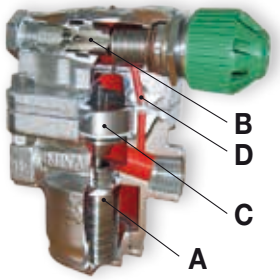
The pilot operated PRV has 4 essential elements:

A Main Valve Unit

B Pilot Valve (same structure as the direct-acting PRV)

C Adjusting Unit (piston and cylinder liner

D Signal Line

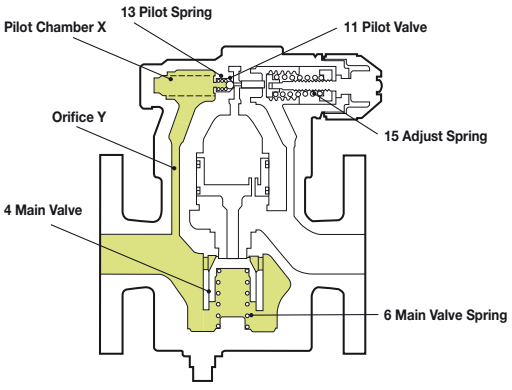


Changes in downstream pressure are sensed by the pilot valve mechanism (bellows connected with a pilot valve unit) through a signal line D, which connects the pilot valve regulator with the secondary pressure side.
Movement of the bellows will open or close the pilot valve, regulating the amount of steam influencing the movement of the piston, which will close or open the main valve, thus keeping downstream pressure on a stable level.

Pilot operated pressure reducing valves are used to improve accuracy and capacity, compared with direct acting pressure regulators. The decision whether to use a direct acting valve or a pilot operated valve depends on the demands of the steam using system.

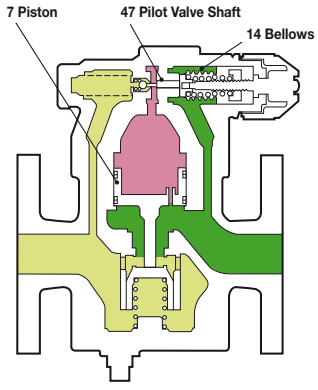
Operating principle **Pilot Operated PRV RE3 & RE10N**

Inlet Steam Pressure Secondary Steam Pressure Adjusting Steam Pressure



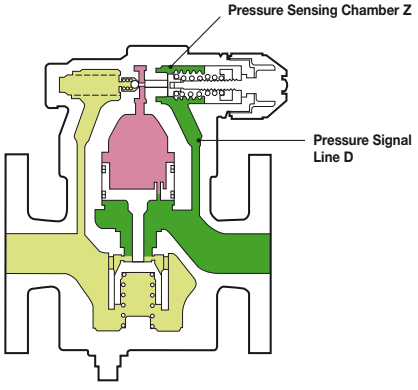
1

Before adjusting the secondary pressure the green handle must be turned clockwise to relea se the adjust spring No.15 until the handle moves freely. In this position the main valve (4) is closed by the force of the spring No. 6 and the pilot valve (11) is closed by the force of the spring No. 13. When steam enters the valve, part of the steam enters the pilot chamber (X) through the orifice (Y).



2

To adjust the secondary pressure the handle must be turned counterclockwise. As a result, the adjust spring (15) will be pressed into the bellows (14). The bellows will expand and the pilot valve shaft (47) will open the pilot valve (11). The steam, which has entered the pilot chamber (X) will flow through the pilot valve unit into the cham-ber above the piston (7). Due to the steam pressure the piston (7) will move downwards and open the main valve (4). Steam will flow towards the secondary side.

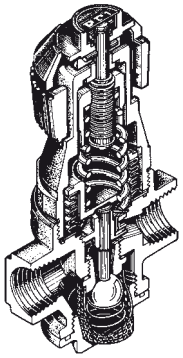


3

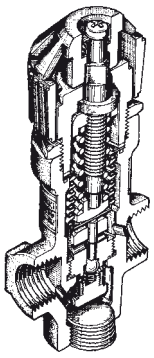
Part of the steam, which flows to the secondary side will enter the pressure sensing chamber (Z) through the pressure signal line (D). Due to the pressure influence, the bellows (14) will contract. Depending on the secondary pressure value the force exerted by the bellows and the force exerted by the adjust spring (15) will be balanced and the opening degree of the pilot valve (11) will be adjusted, thus regulating the amount of steam flowing through the pilot valve to the piston. Consequently, the opening degree of the main valve (4) will be also adjusted to regulate the steam flow in the direction of the secondary side maintaining a stable steam flow and steam pressure on the secondary side.

SERIES RE Pressure Reducing Valve

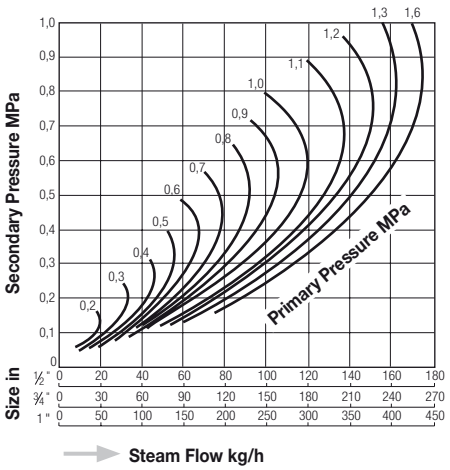
RE1

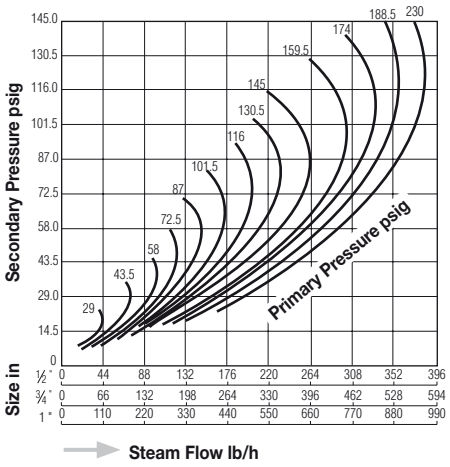


RE2

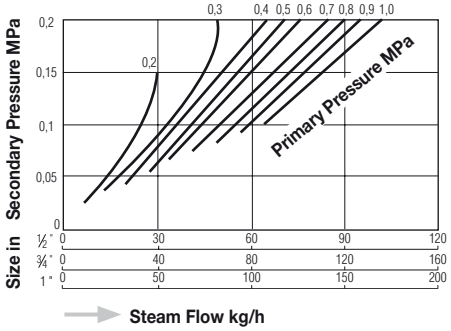


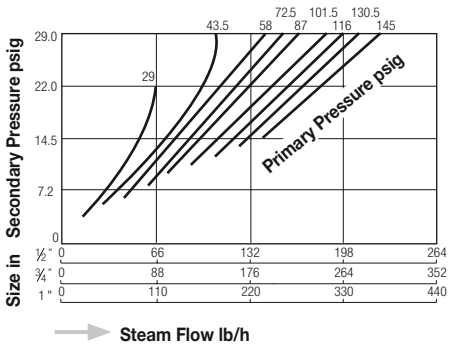
Capacity Charts **RE1, RE1-4**



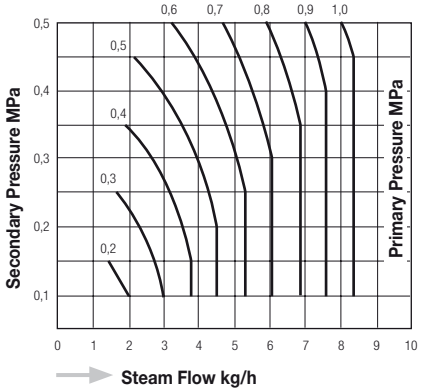


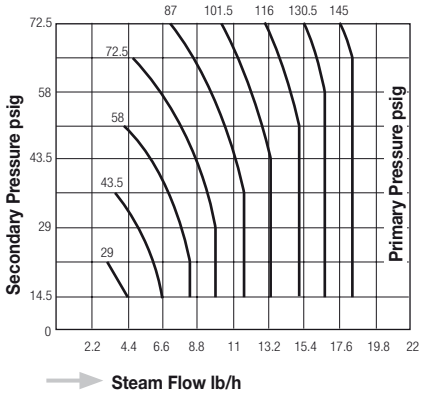
Capacity Charts **RE1-2**



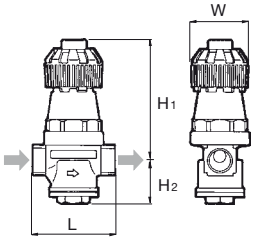


Capacity Charts **RE2**

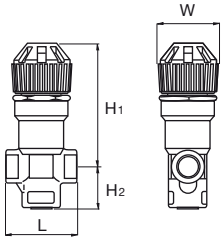




Dimensions **RE1**

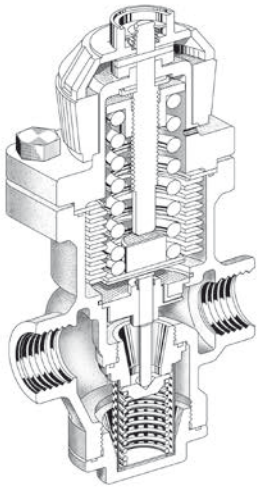


Dimensions **RE2**



Model	Connection	Size (in)	Operating Pressure (Primary)		Secondary Pressure		Max. Red. Pressure Ratio	Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	MPa	psig		°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
RE1	Screwed Rc, NPT	½"	0,2 – 1,6	29 – 230	0,05 – 1,0	7.2 – 145	10 : 1	204	399	80	137	46	65	3.2	5.4	1.8	2.6	Brass	1,4	3.1
		¾"								90				3.5					1,6	3.5
		1"								105	144	58		4.1	5.7	2.3			1,9	4.2
RE1-4		½"	0,2 – 1,0	29 – 145	0,05 – 0,4	7.2 – 58	10 : 1	204	399	80	137	46	65	3.2	5.4	1.8	2.6		1,4	3.1
		¾"								90				3.5					1,6	3.5
		1"								105	144	58		4.1	5.7	2.3			1,9	4.2
RE1-2		½"	0,2 – 1,0	29 – 145	0,02 – 0,2	2.9 – 29	10 : 1	204	399	80	137	46	65	3.2	5.4	1.8	2.6		1,4	3.1
		¾"								90				3.5					1,6	3.5
		1"								105	144	58		4.1	5.7	2.3			1,9	4.2
RE2		⅜"	0,2 – 1,0	29 – 145	0,1 – 0,5	14 – 72	10 : 1	184	363	50	89	31	43	2.0	3.5	1.2	1.7		0,56	1.2

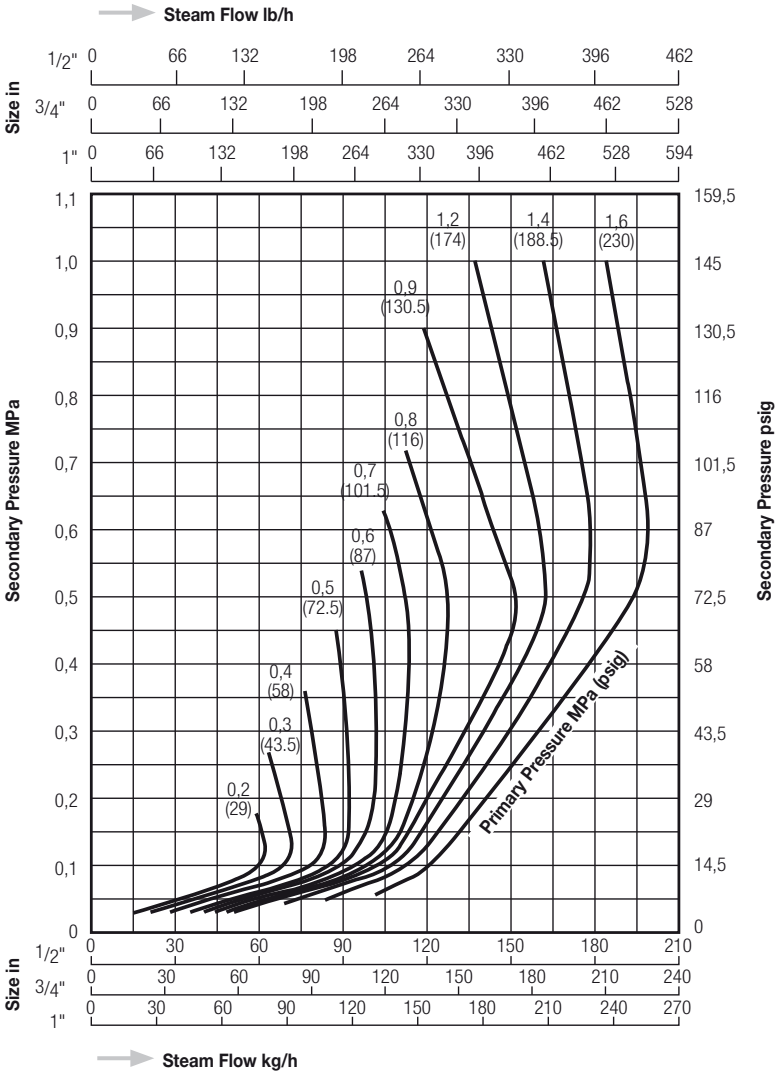
REC1



Minimum Differential Pressure:
more than 10 % of Operating Pressure

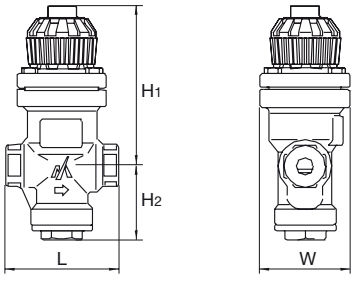
Body Material:
Stainless Steel SCS14

Capacity Chart REC1

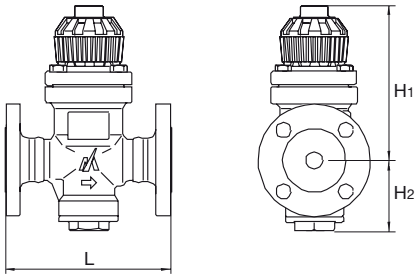


Dimensions

REC1 – Screwed

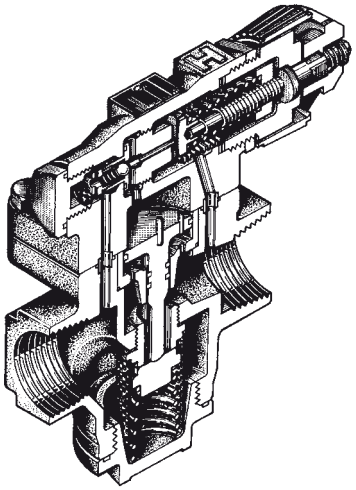


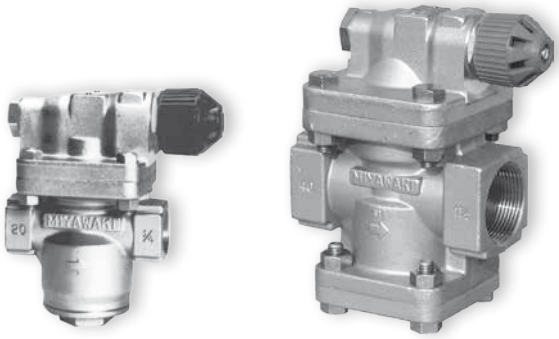
REC1 – Flanged



Model	Connections	Size (in)	Operating Pressure (Primary)		Secondary Pressure		Max. Red. Pressure Ratio	Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Weight	
			MPa	psig	MPa	psig		°C	°F	L	H_1	H_2	W	L	H_1	H_2	W	kg	lb
REC1-2	Screwed Rc, NPT, Rp	½¨ – 1¨	0,2 – 1,6	29 – 230	0,02 – 0,2	2.9 – 29	30 : 1	220	428	96	138	63	78	3.8	5.4	2.5	3.1	2,9	6.4
REC1-6		½¨ – 1¨	0,2 – 1,6	29 – 230	0,18 – 0,6	26 – 87	8,9 : 1											2,8	6.2
REC1-10		½¨ – 1¨	0,6 – 1,6	87 – 230	0,54 – 1,0	78 – 145	3 : 1											2,8	6.2
REC1-2F	Flanged JIS, ASME, DIN	½¨	0,2 – 1,6	29 – 230	0,02 – 0,2	2.9 – 29	30 : 1			150	138	63	78	5.9	5.4	2.5	3.1	4,5	9.9
		¾¨																5,1	11.2
		1¨								160				6.3				5,9	13
REC1-6F		½¨	0,2 – 1,6	29 – 230	0,18 – 0,6	26 – 87	8,9 : 1			150	138	63	78	5.9	5.4	2.5	3.1	4,5	9.9
		¾¨																5,1	11.2
		1¨								160				6.3				5,9	13
REC1-10F		½¨	0,6 – 1,6	87 – 230	0,54 – 1,0	78 – 145	3 : 1			150	138	63	78	5.9	5.4	2.5	3.1	4,5	9.9
		¾¨																5,1	11.2
		1¨								160				6.3				5,9	13

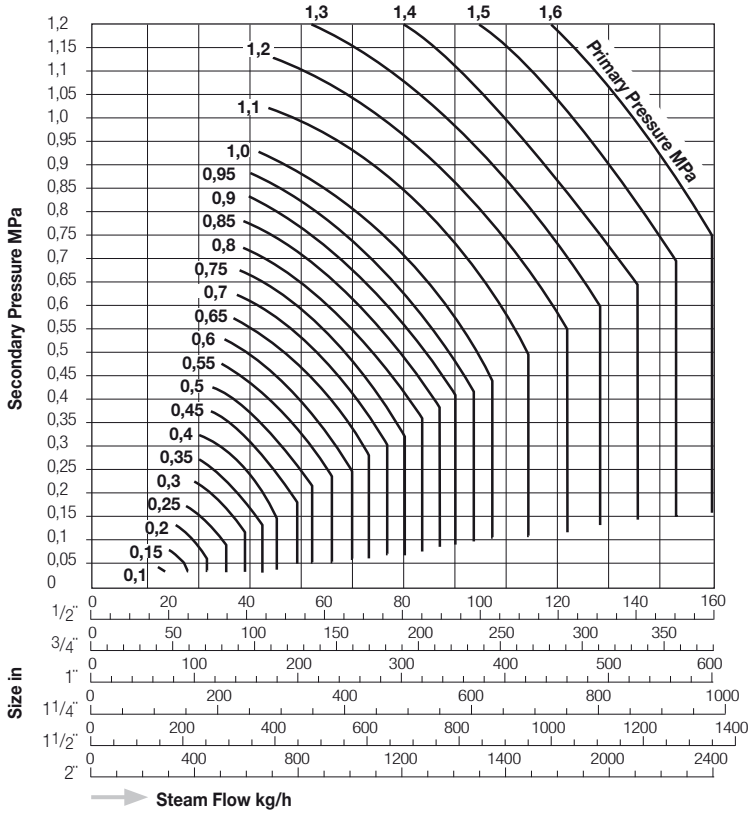
RE3

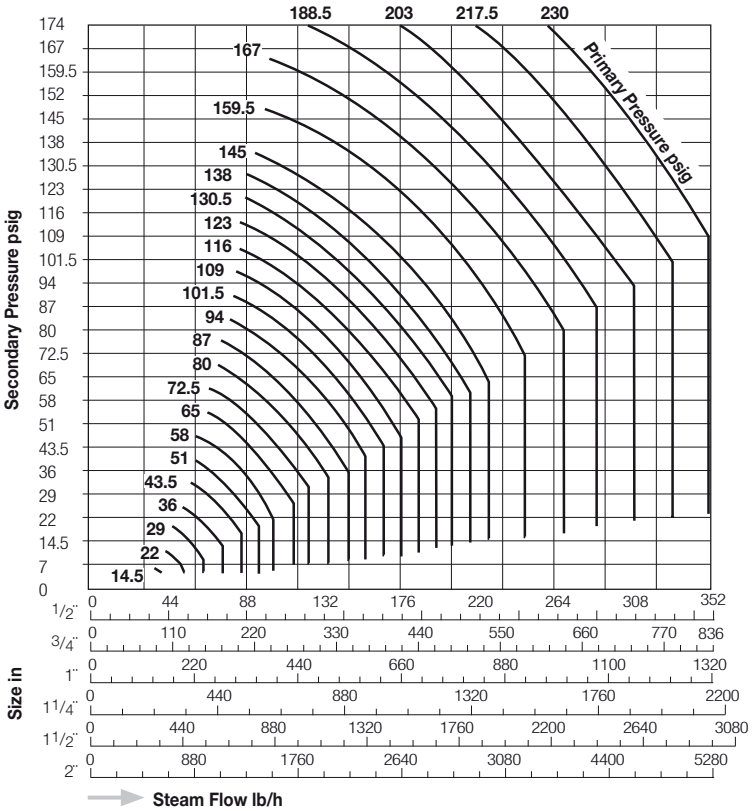




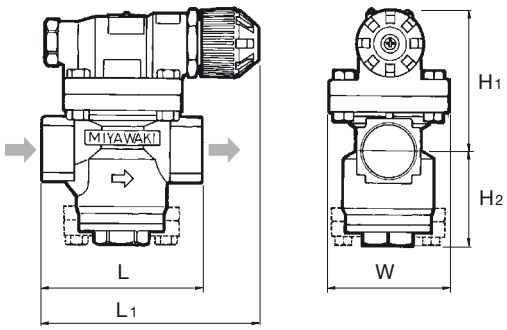
Body Material: Brass C3771

Capacity Charts **RE3**



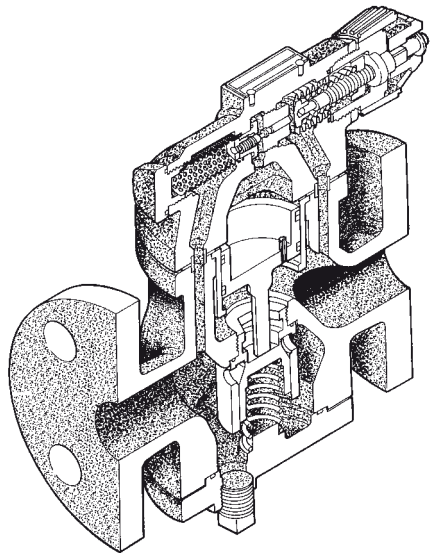


Dimensions **RE3**



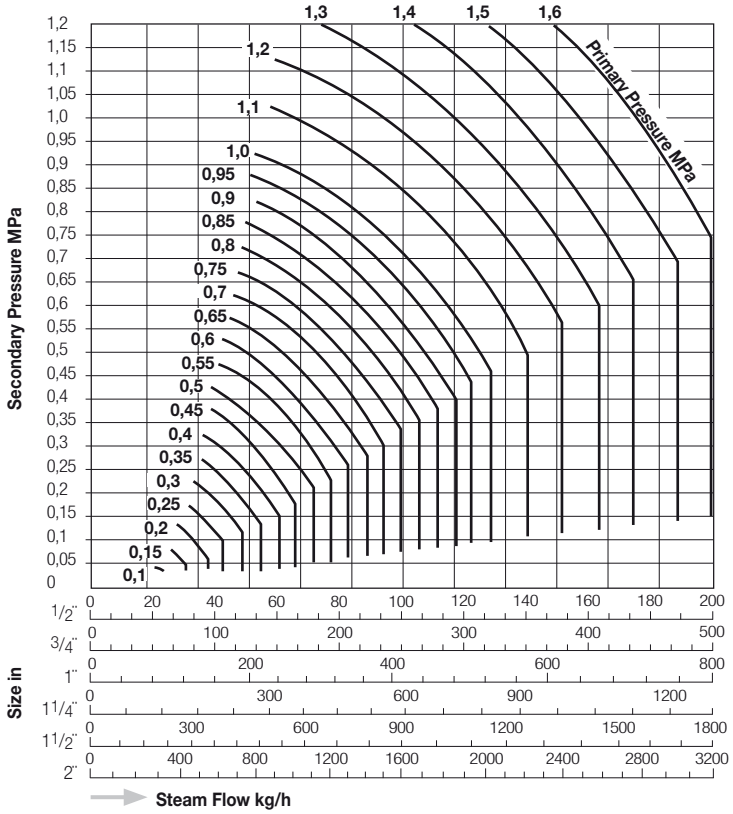
Model	Connec.	Size (in)	Operating Pressure (Primary)		Secondary Pressure		Max. Red. Pressure Ratio	Max. Oper. Temperature		Dimensions (mm)					Dimensions (in)					Weight	
			MPa	psig	MPa	psig		°C	°F	L	L_1	H_1	H_2	W	L	L_1	H_1	H_2	W	kg	lb
RE3	Screwed Rc, NPT	½"	0,1 – 1,6	14.5 – 230	0,03 – 1,2	4.4 – 174	20 : 1	220	428	90	127	87	58	74	3.5	5.0	3.4	2.3	2.9	2,8	6.2
		¾"								95	130				3.7	5.1				2,9	6.4
		1"								100	132				3.9	5.2					
		1¼"								130	155	111	73	96	5.1	6.1	4.4	2.9	3.8	6,2	13.6
		1½"																		6,3	13.9
		2"								140	157	121	79	110	5.5	6.2	4.8	3.1	4.3	8,2	18.0

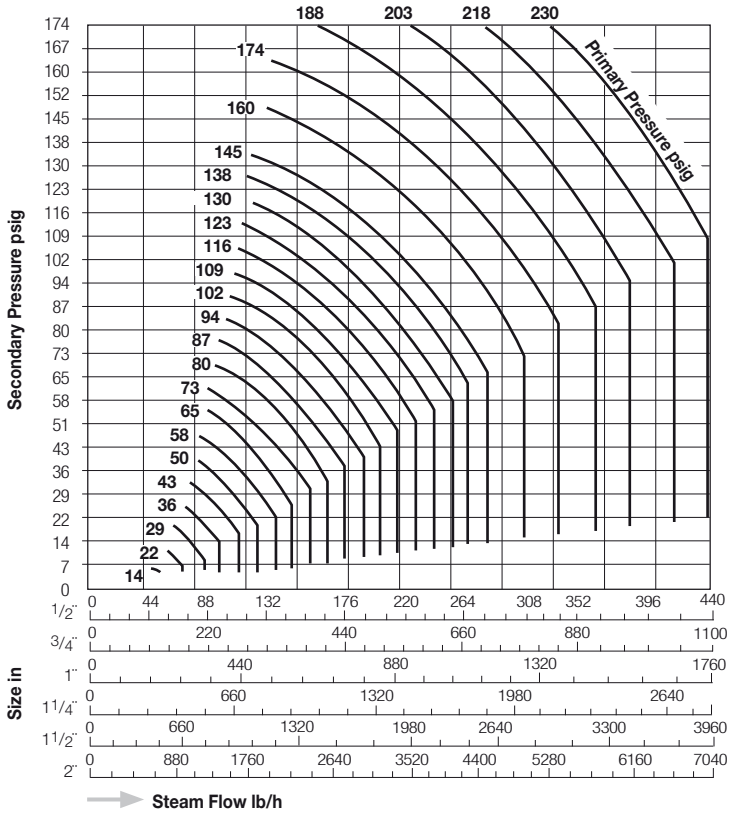
RE10N



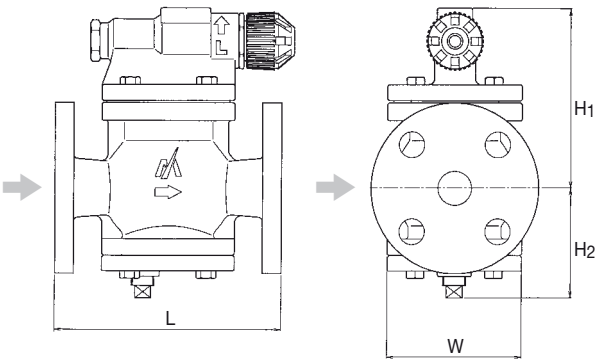
Body Material: Ductile Cast Iron FCD450

Capacity Charts **RE10N**



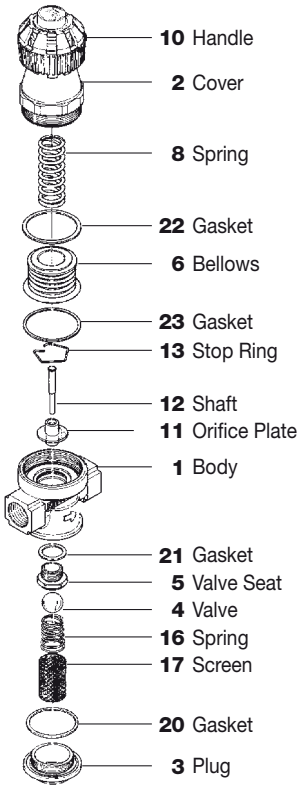


Dimensions **RE10N**

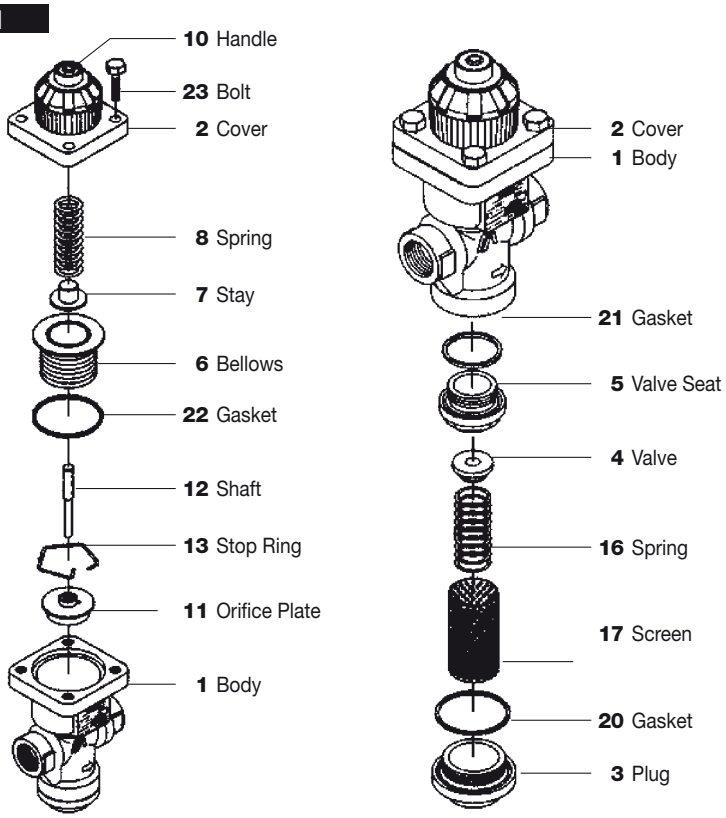


Model	Connection	Size (in)	Operating Pressure (Primary)		Secondary Pressure		Max. Red. Pressure Ratio	Max. Oper. Temperature		Dimensions (mm)				Dimensions (in)				Weight	
			MPa	psig	MPa	psig		°C	°F	L	H_1	H_2	W	L	H_1	H_2	W	kg	lb
RE10N	Flanged JIS, ASME, DIN	½"	0,1 – 1,6	14.5 – 230	0,03 – 1,2	4.4 – 174	20 : 1	220	428	160	133	80	100	6.3	5.2	3.1	3.9	7,0	15.4
		¾"																7,4	16.3
		1"								170				6.7				8,1	17.8
		1¼"								200	154	103	130	7.9	6.1	4.1	5.1	14,1	31.0
		1½"																14,3	31.5
		2"								220				8.7				15,5	34.1

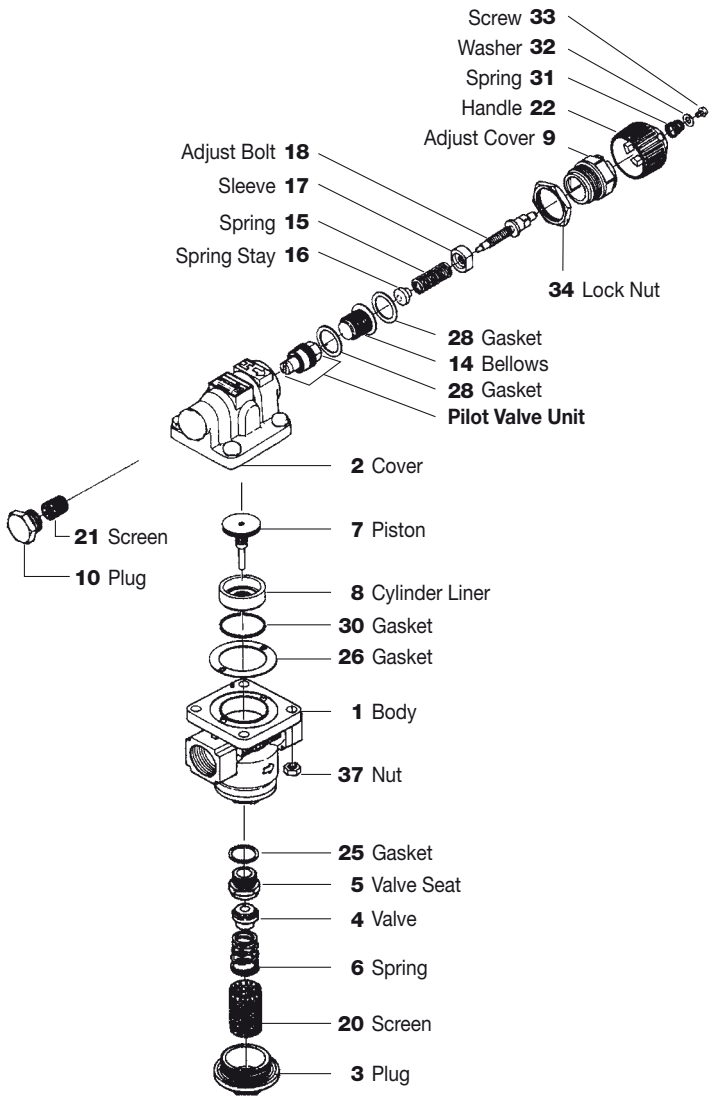
RE1



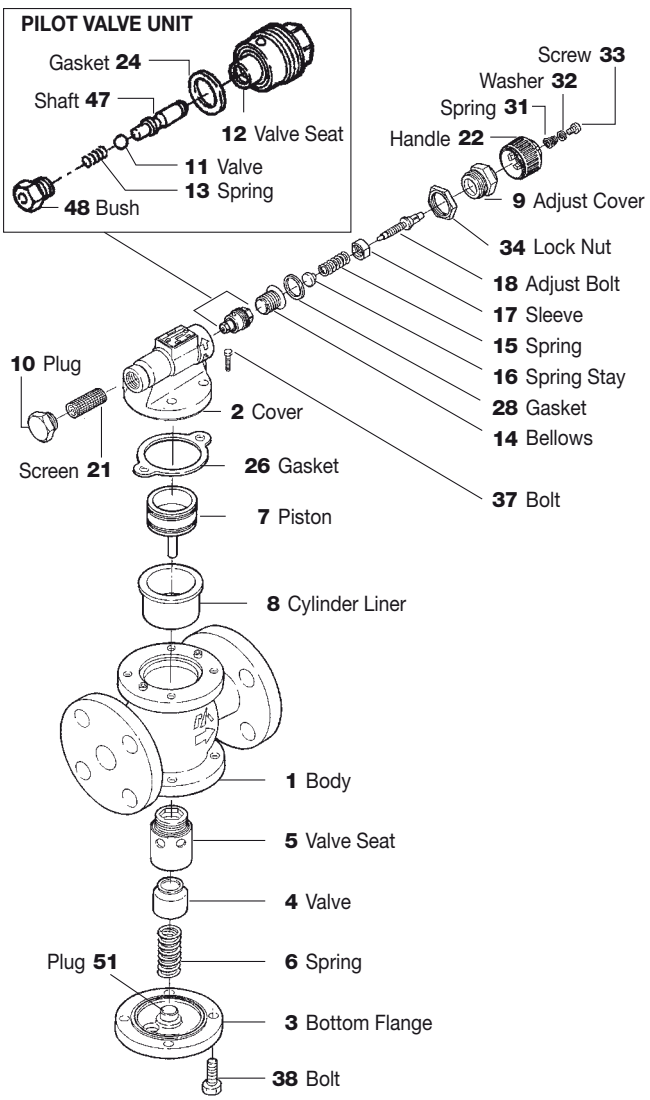
REC1



RE3



RE10N



Steam-Water-Mixing Valve

SERIES MX

MX1N

Features

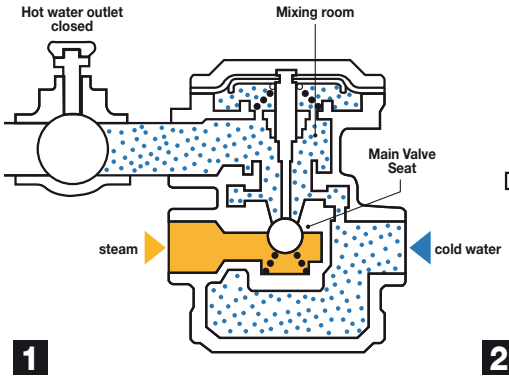
1. Temperature is thermostatically controlled.
2. Can be installed where steam and cold water are available.
3. Produces hot water quickly and efficiently.
4. Efficient energy saving.
5. Precise thermostatic control.
6. Inline repairability.
7. Nickel plated finish.

Suitable for

Washing down floors, vehicles, vats, jacketed vessels, backflushing filters, washing out vessels and other equipment in the dairy, brewery, food, chemical and soap manufacturing industries and wherever hot water is required economically.

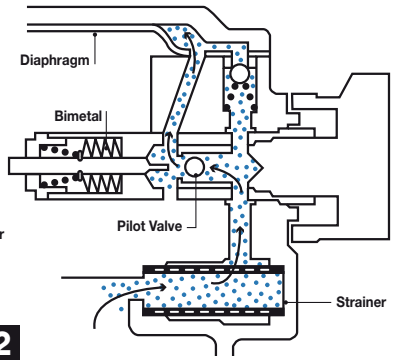
Operating principle

cold water hot water steam



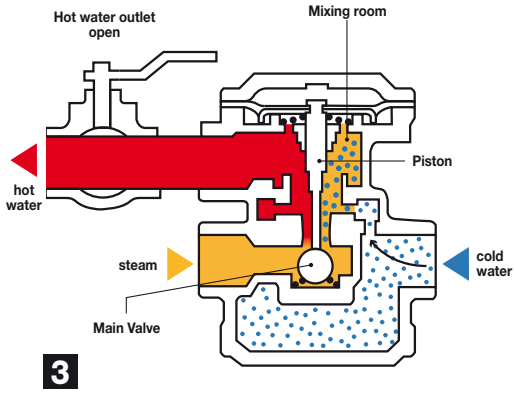
1

The cold water occupies the lower part of the body completely, flows through a hole next to the seat of the main valve into the mixing room and occupies it up to the hot water outlet. The main valve is closed. The steam can´t enter the mixing room.



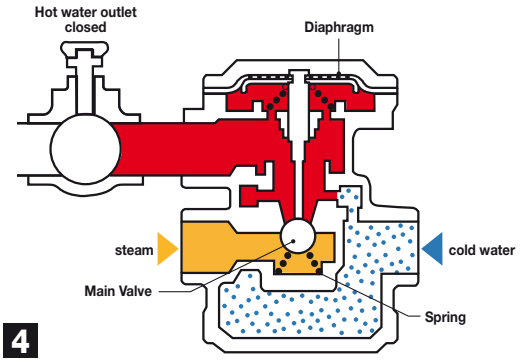
2

When you open the hot water outlet the cold water flows from the mixing room to the hot water outlet. During this process one part of the cold water flows through the strainer and runs behind the pilot valve (which is connected with the bimetal unit) into the space above the diaphragm.



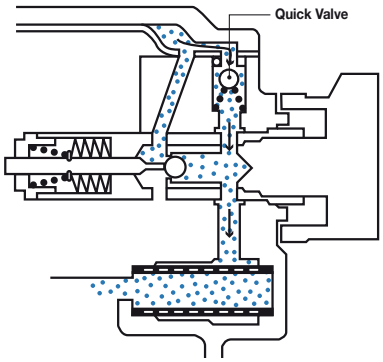
3

The water pressure in the space above the diaphragm increases and pushes the diaphragm and the connected piston downwards. Consequently, the main valve opens and the steam flows into the mixing room and mixes with the cold water. The hot water flows to the hot water outlet.



4

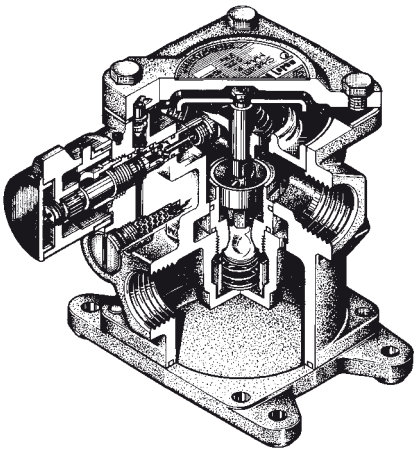
When the hot water outlet is being closed the pressure in the mixing room rises, the pressure on the diaphragm increases and the diaphragm returns to its original position. The main valve closes due to the pressure of the spring and the steam.



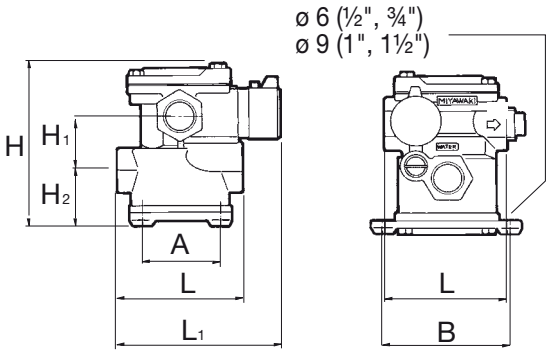
5

The pressure above the diaphragm is equalized by the quick valve. The pilot valve is closed.

MX1N Steam-Water-Mixing Valve



Dimensions



Connection	Size (in)	Max. Operating Pressure				Min. Operating Pressure				Max. Temperature	Max. Pressure Ratio	Max. Temperature	Dimensions mm (in)							Weight	
		Steam		Water		Steam		Water		Steam	steam : water (water : steam)	Hot Water									
		MPa	psig	MPa	psig	MPa	psig	MPa	psig	°C		°C	L	L_1	H	H_1	H_2	A	B	kg	lb
Screwed Rc, NPT	½ ¨	1,0	145	1,0	145	0,03	5	0,03	5	185	3 : 1	93	100 (3.9)	138 (5.4)	134 (5.3)	43 (1.7)	47 (1.9)	62 (2.4)	102 (4.0)	4,2	9.2
	¾ ¨																				
	1 ¨												140 (5.5)	179 (7.0)	179 (6.6)	57 (2.2)	51 (2.0)	86 (3.4)	147 (5.8)	10,5	23.1
	1½ ¨												160 (6.3)	189 (7.4)	189 7.8)	70 (2.8)	60 (2.4)	86 (3.4)	147 (5.8)	14,1	

Body Material: Brass S3771

Hot Water Capacity **MX1N**

Ratio **Steam Pressure : Cold Water Pressure = 1 : 1, Cold Water Temperature 15°C**

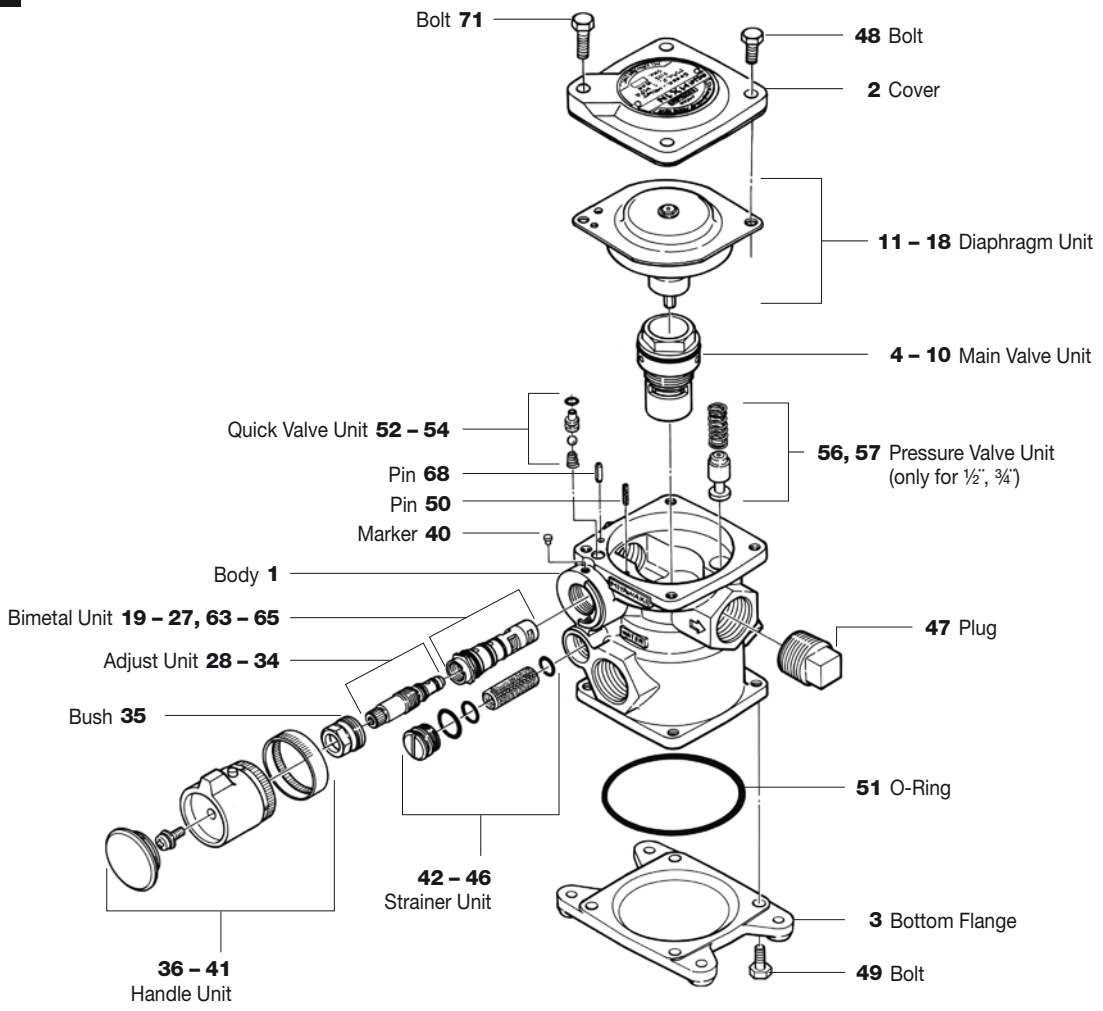
Size (in)	Pressure	Pressure	Hot Water Flow Amount (l/min)											
			40°C		50°C		60°C		70°C		80°C		90°C	
	MPa	psig	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
½ ¨	0,1	14.5	3	12	3	12	3	13	5	13	5	11	5	10
	0,2	29.0	3	20	3	21	3	21	5	20	5	17	10	14
	0,3	43.5	6	25	6	25	6	26	9	26	9	22	13	19
	0,4	58.0	6	29	6	29	6	29	12	30	12	28	17	24
	0,5	72.5	7	32	7	32	8	33	13	34	18	34	29	29
	0,6	87.0	7	35	7	36	16	36	17	37	27	37	34	34
	0,7	101.5	8	38	9	38	21	39	21	40	37	40	38	38
¾ ¨	0,1	14.5	5	22	5	23	5	20	8	17	8	14	9	12
	0,2	29.0	5	32	5	32	5	31	8	25	8	21	13	18
	0,3	43.5	8	39	8	39	8	40	10	34	10	28	25	25
	0,4	58.0	9	45	9	45	9	46	14	42	20	36	31	31
	0,5	72.5	11	50	11	51	11	52	15	51	23	43	37	37
	0,6	87.0	12	55	12	55	23	56	23	57	42	50	43	43
	0,7	101.5	14	59	15	60	44	61	45	62	56	56	49	49
1 ¨	0,1	14.5	30	54	30	54	29	47	23	38	20	32	17	28
	0,2	29.0	38	76	39	77	48	70	37	57	31	49	27	42
	0,3	43.5	48	93	48	94	65	94	52	77	44	65	38	56
	0,4	58.0	54	107	55	109	66	111	67	97	57	82	49	71
	0,5	72.5	60	120	66	122	67	124	82	116	69	98	60	85
	0,6	87.0	66	131	67	133	68	135	97	136	82	115	71	100
	0,7	101.5	71	142	72	144	73	146	107	149	93	130	81	112
1½ ¨	0,1	14.5	91	140	83	116	64	90	53	74	45	63	39	54
	0,2	29.0	116	197	137	175	100	136	82	112	69	94	60	82
	0,3	43.5	136	242	170	235	136	183	112	149	94	126	82	110
	0,4	58.0	153	279	170	284	172	229	141	188	119	159	103	138
	0,5	72.5	171	312	173	317	210	276	172	226	146	191	126	166

Max. Temperature of hot water – Ratio Steam Pressure 1 : 1

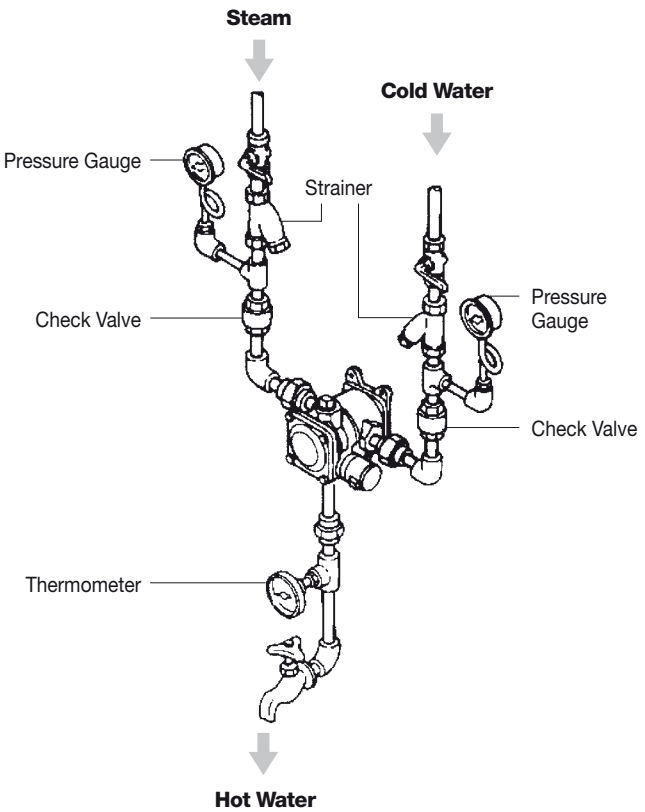
½ ¨	93°C	¾ ¨	93°C	1 ¨	93°C	1½	93°C

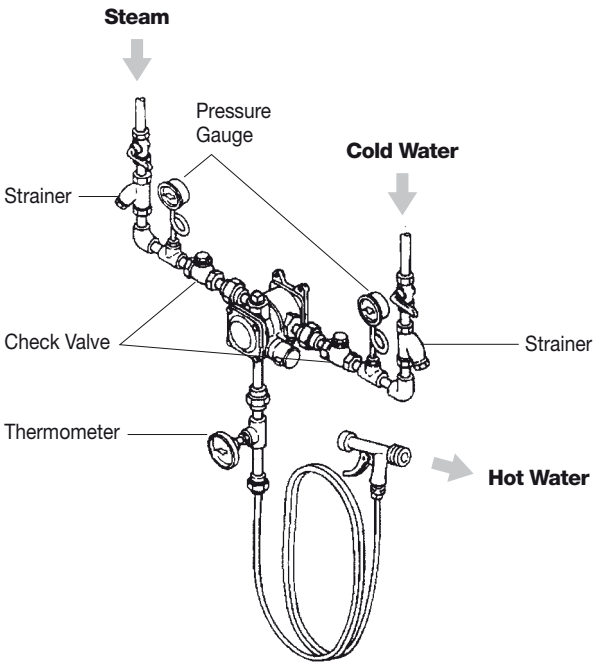
Please, look at our Website **www.miyawaki.net (Products/Steam Water Mixing Valves)** for more detailed flow charts containing hot water flow rates of the MX1N. If you require further technical details, please ask for our technical leaflet on Steam Water Mixing Valves.

MX1N



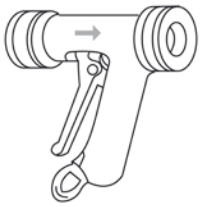
MX1N Installation Examples



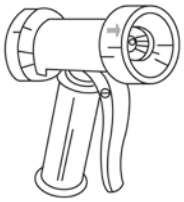


MK

MK-2



MK-82



Model	Material	Rubber Cover	Trigger	Orifize Size		Maximum Pressure	
				in	mm	MPa	psi
MK-2	Gunmetal or Stainless Steel	Black or White	rear	5/16¨	7,9	2,8	406.0
MK-OH				7/16¨	11,1		
MK-MV				9/16¨	14,3	0,7	101.5
MK-78	Gunmetal	Black or White	front	5/16¨	7,9	1,4	203.0
MK-80				7/16¨	11,1		
MK-82				9/16¨	14,3	0,7	101.5

Pressure		Orifize Size			Orifize Size		
		5/16¨	7/16¨	9/16¨	5/16¨	7/16¨	9/16¨
MPa	psig	l/min			GPM		
0,035	5.0	3,2	13,5	15,0	0.84	3.56	3.96
0,07	10.2	5,6	20,0	21,0	1.48	5.28	5.54
0,1	14.5	7,0	22,5	24,0	1.85	5.94	6.34
0,2	29.0	10,0	25,0	36,0	2.64	6.60	9.50
0,3	43.5	12,5	32,0	47,0	3.30	8.45	12.41
0,35	50.8	14,5	37,0	52,0	3.83	9.77	13.73
0,4	58.0	16,0	38,0	55,0	4.22	10.03	14.52
0,5	72.5	18,0	40,0	60,0	4.75	10.56	15.84
0,6	87.0	20,5	42,0	65,0	5.41	11.09	17.16
0,7	101.5	22,3	44,0	69,0	5.89	11.62	18.22
1,0	145.0	27,5	51,0	–	7.26	13.46	–
1,5	217.5	35,0	62,0	–	9.24	16.37	–
2,0	290.0	43,0	74,0	–	11.35	19.54	–
2,5	362.5	50,5	85,0	–	13.33	22.44	–

Features

1. Trigger operated water gun. Front trigger or rear trigger available
2. Perfect water consumption control
3. One-handed mode with either variable spray or direct jet
4. Automatic and immediate shut-off when the trigger is released

Suitable for

MK2 is suitable for most industrial applications

MK-MV is recommended for use with Steam-Water-Mixing Valves

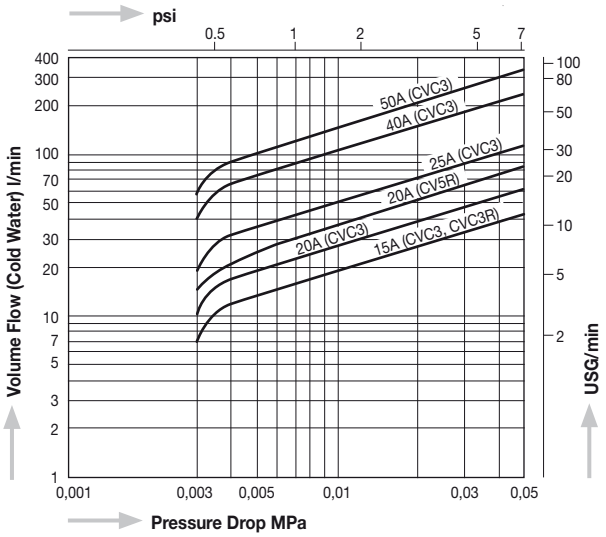
CVC3, CVC3R, CV5R Check Valve

CVC3, CVC3R, CV5R

CVC3, CVC3R

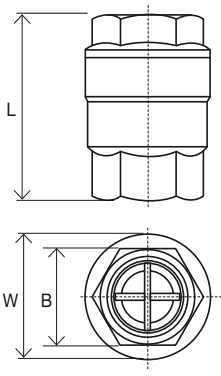
CV5R

Pressure Drop Chart

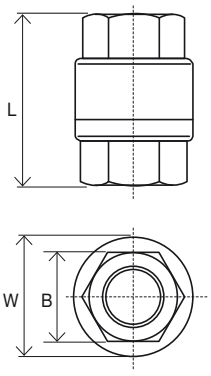


Dimensions

CVC3, CVC3R



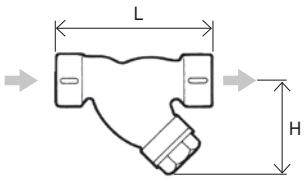
CV5R



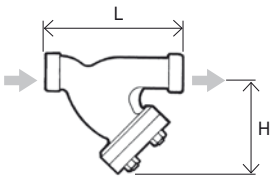
Model	Connections	Size (in)	Max. Operating Pressure		Opening Pressure		Max. Operating Temperature		Dimensions (mm)			Dimensions (in)			Body Material	Weight	
			MPa	psig	MPa	psig	°C	°F	L	W	B	L	W	B		kg	lb
CVC3	Screwed Rc, NPT	½¨	2,1	305	0,003	0.44	220	428	48	35	27	1.9	1.4	1.1	Stainless Steel SCS13A	0,2	0.44
		¾¨							61	43	33	2.4	1.7	1.3		0,3	0.66
		1¨							73	54	41	2.9	2.1	1.6		0,6	1.32
		1½¨							87	75	58	3.4	3.0	2.3		1,2	2.64
		2¨							100	90	72	3.9	3.5	2.8		1,8	3.96
CVC3R	Screwed Rc, NPT	½¨	2,1	305	0,003	0.44	80	176	48	35	27	1.9	1.4	1.1	SCS13A	0,2	0.44
CV5R	Screwed Rc, NPT	¾¨	1,6	230	0,003	0.44	80	176	60	40	34	2.4	1.6	1.3	SCS13A	0,3	0.66

Y

Dimensions **YM1**



YSF-W

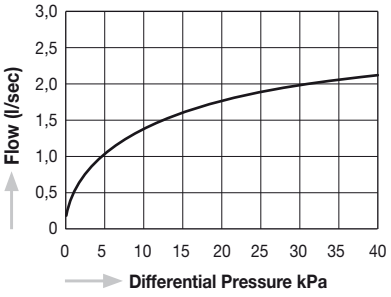


Model	Connections	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Mesh	Dimensions (mm)		Dimensions (in)		Body Material	Weight	
			MPa	psig	°C	°F		L	H	L	H		kg	lb
YM1	Screwed Rc, NPT	½¨	2,0	290	220	428	60	75	55	3.0	2.2	Ductile Cast Iron	0,5	1.1
		¾¨						90	70	3.5	2.8		0,9	2.0
		1¨						110	85	4.3	3.3		1,4	3.1
YSF-W	Socket Weld	½¨ – 1¨	4,9	710	425	797	60	140	125	5.5	4.9	Forged Steel A105	5,0	11.0
		1¼¨ – 2¨						190	170	7.5	6.7	Forged Steel S25C	9,5	20.9

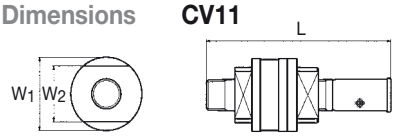
Vacuum Breaker CV11, CVU15

CV11,CVU15

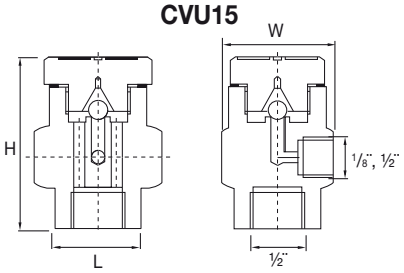
Capacity Chart **CVU15**



Dimensions **CV11**



CVU15



Model	Connections		Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)					Dimensions (in)					Body Material	Weight	
				MPa	psig	°C	°F	L	H	W	W_1	W_2	L	H	W	W_1	W_2		kg	lb
CV11	Male thread R		½¨	0,9	130	150	302	130			50	38	5.1			2.0	1.5	Stainless Steel SUS304	0,8	1.8
			¾¨					135					5.3							
			1¨					135					5.3							
CVU15	System connection	Air inlet connection	½¨ x 1/8¨	2,1	305	450	842	32	55	37			1.26	2.16	1.45			Stainless Steel AISI 304 (DIN 1.4301)	0,38	0.84
	½¨ Screwed (BSP, BSPT, NPT)	1/8¨, ½¨ Screwed (BSP, BSPT, NPT)	½¨ x ½¨						70					2.75					0,55	1.21

Anti-Freezing Valve F1

F1

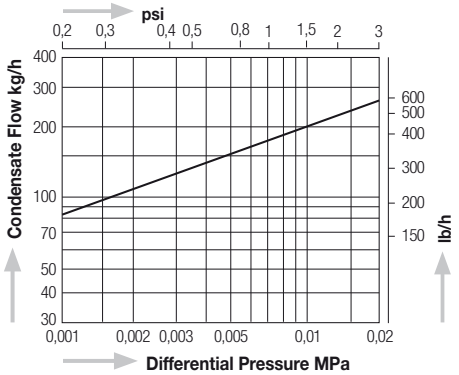
Features

1. Easy installation: compact in size
2. No adjustment
3. Easy maintenance

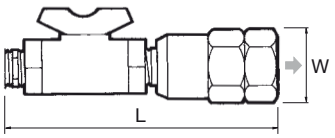
Suitable for

Discharge of remaining condensate out of steam traps and pipe lines

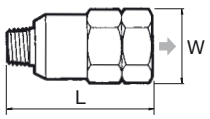
Capacity Chart **F1**



Dimensions **F1B**



F1



Model	Connection	Size (in)	Max. Operating Pressure		Working Pressure				Max. Operating Temperature		Dimensions (mm)		Dimensions (in)		Body Material	Weight	
					Opening		Closing										
			MPa	psig	MPa	psig	MPa	psig	°C	°F	L	W	L	W		kg	lb
F1B	Screwed Rc, NPT	¼¨	1,0	145	0,01 – 0,04	1.5 – 5.8	0,02 – 0,05	2.9 – 7.3	220	428	105	27	4.1	1.1	Brass C3771	0,19	0.42
		⅜¨									110		4.3			0,23	0.51
F1		¼¨, ⅜¨	1,6	230							52		2.0			0,13	0.29

TS1, T3 Sight Glass

TS1

Features

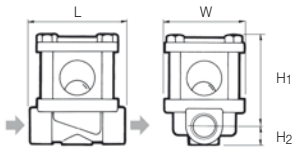
To check operation of steam traps

Suitable for

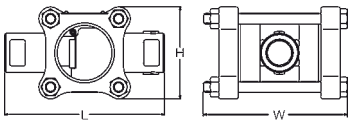
Steam and liquid lines

T3

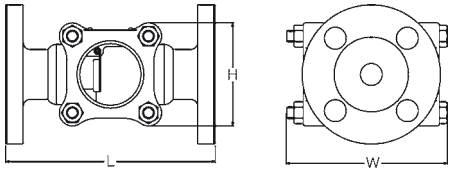
Dimensions TS1



T3



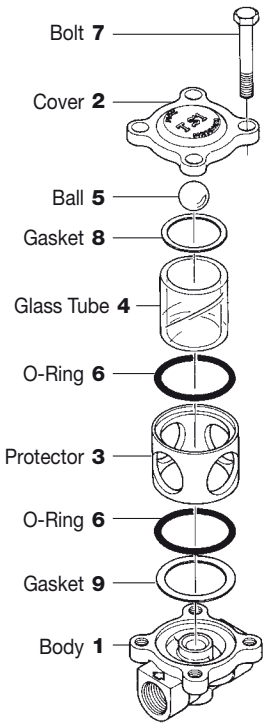
T3F



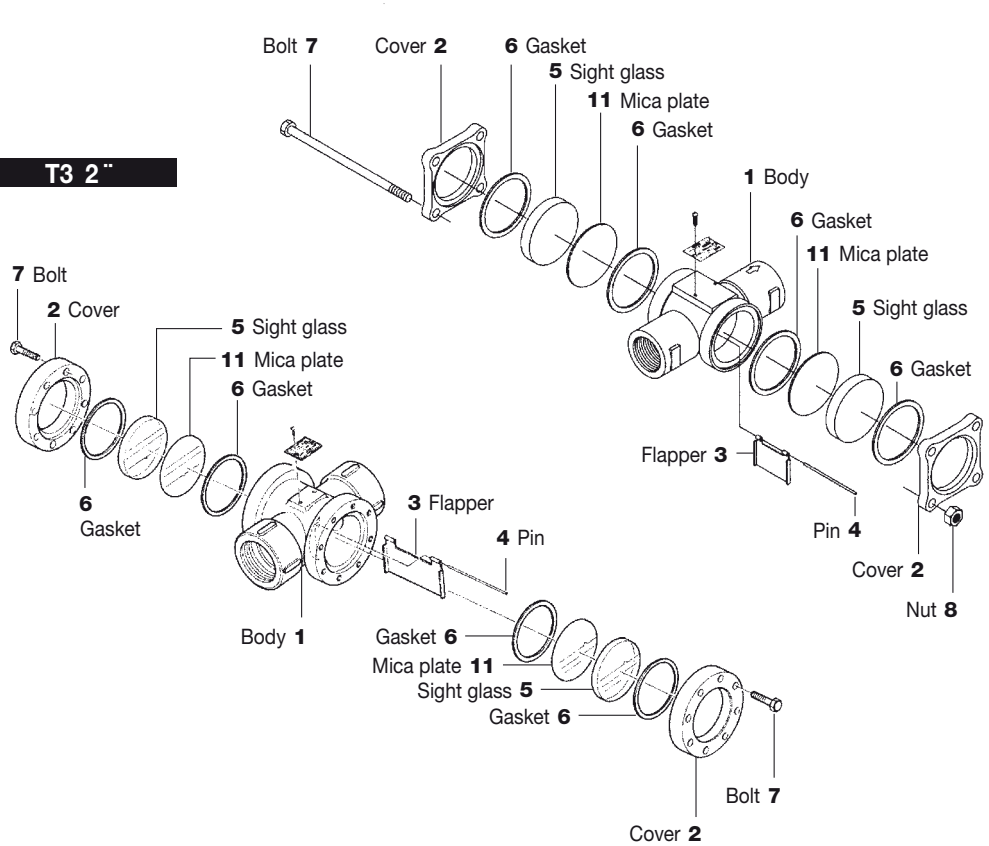
Model	Connect.	Size (in)	Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)					Dimensions (in)					Body Material	Weight	
			MPa	psi	°C	°F	L	H	H_1	H_2	W	L	H	H_1	H_2	W		kg	lb
TS1	Screwed	½¨	0,8 Steam 1,0 Water 0,97 Air	116 Steam 145 Water 140 Air	180 Steam 100 Water 100 Air	356 Steam 212 Water 212 Air	80		69	14	60	3.1		2.7	0.5	2.4	Brass C3771	0,9	1.8
		¾¨							71	17				2.8	0.7			1,0	2.0
		1¨					85		76	21		3.3		3.0	0.8			1,2	2.2
T3	Screwed	½¨	1,0	145	183	361	123	70			110	4.8	2.8			4.3	Cast Steel A216WCB	1,6	3.5
		¾¨, 1¨																1,7	3.7
		1¼¨					170	85			155	6.7	3.3			6.1		3,3	7.3
		1½¨																3,2	7.0
		2¨					195	115			185	7.7	4.5			7.3	Cast Iron FC200	7,3	16.1
T3F	Flanged	½¨	1,0	145	183	361	144	70			110	5.7	2.8			4.3	Cast Steel A216WCB	3,3	7.3
		¾¨																4,4	9.7
		1¨																5,0	11.0
		1¼¨					180	85			155	7.1	3.3			6.1		8,0	17.6
		1½¨																9,0	19.8
		2¨					210	115			185	8.3	4.5			7.3	Cast Iron FC200	12,0	26.4

Spare Parts

TS1

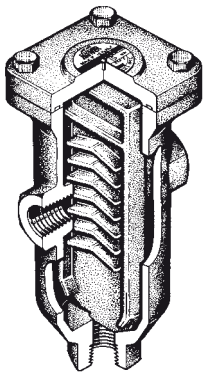


T3 1/2¨ – 1 1/2¨



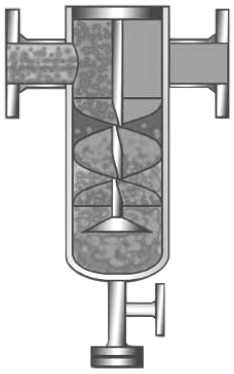
T3 2¨

H3



H5

H9XF



Features

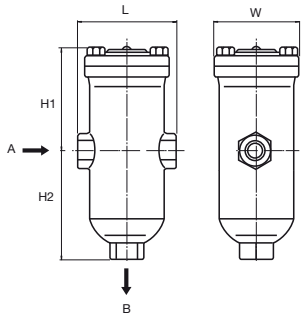
1. Separates mist, condensate from steam and/or air lines
2. Compact size – easy installation together with Pressure Reducing Valves and Steam Traps
3. Very low pressure loss (0,002 MPa)

Suitable for

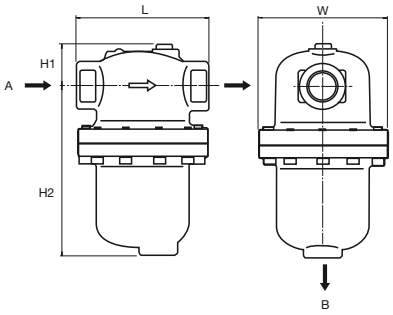
All steam and air lines

Dimensions

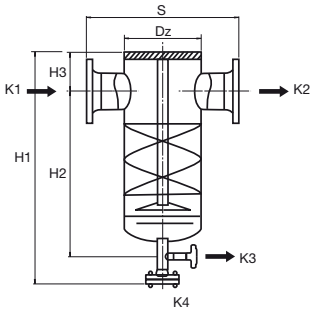
H3



H5



H9XF



Model	Connections	Size (in)		Max. Operating Pressure		Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
		A	B	MPa	psig	°C	°F	L	H_1	H_2	W	L	H_1	H_2	W		kg	lb
H3	Screwed Rc, NPT	½¨	½¨	1,6	230	220	428	100	93	120	86	3.9	3.7	4.7	3.4	Ductile Cast Iron FCD450	3,6	7.9
		¾¨	½¨					130	120	158	108	5.1	4.7	6.2	4.3		6,7	14.7
		1¨	½¨					160	130	180	128	6.3	5.1	7.1	5.0		10.1	22.2
H5	Screwed Rc, NPT	½¨	¾¨	2,0 (Air: 0,97)	290 (Air: 141)	220	428	150	50	193	146	5.9	2.0	7.6	5.7		7,1	15.6
		¾¨																
		1¨															7,3	16.1
		1¼¨	1¨					190	69	213	175	7.5	2.7	8.4	6.9		12,5	27.5
		1½¨																
		2¨						219	82	260	199	8.6	3.2	10.2	7.8		20,5	45.1

Model	Connect.	Size (DN)	PN	Inlet	Outlet	Condens. Outlet	Dirt Pocket	Dimensions (mm)					Dimensions (in)					Body Material	Weight	
				K_1 (DN)	K_2 (DN)	K_3 (DN)	K_4 (DN)	Dz	H_1	H_2	H_3	S	Dz	H_1	H_2	H_3	S		kg	lb
H9XF	Flanged DIN, ASME	15	16	15	15	15	15	88,9	360	240	50	240	3.5	14.2	9.4	2.0	9.4	Steel P235 GH	6,8	14.96
		20		20	20														7,3	16.06
		25		25	25														7,8	17.16
		32		32	32			114,3	460	320	70	310	4.5	18.1	12.6	2.8	12.2		12	26.4
		40		40	40														12,5	27.5
		50		50	50		25	168,3	640	440	100	420	6.6	25.2	17.3	3.9	16.5		26	57.2
		65		65	65														27	59.4
		80		80	80														29	63.8
		100		100	100	20	32	273	900	630	160	560	10.7	35.4	24.8	6.3	22.0		61	134.2
		125		125	125														65	143.0
		150		150	150	25	40	323,9	1040	735	185	620	12.8	40.9	28.9	7.3	24.4		95	209.0
		200		200	200	on request														

Other pressure ratings (PN25, PN40), connections and body materials on request.

Steam Trap Survey Assistant

Dr. Trap® Jr.

PM11

It is the ideal partner for steam traps inspections.

PM11 is capable to work with most of the steam traps of the main manufacturers.

Certified according to the European EMC Directive (2004/108/EC)

Ultrasonic Checker PM11

Temperature Probe

SurveyPro Light PM150 V2.0

Features PM11

The Steam Trap Ultrasonic Checker PM11 has been designed to assess the operating condition of steam traps during operation by measuring the vibration and the temperature of the surface.

- The system consists of the Ultrasonic Checker PM11, a Temperature Probe and the SurveyPro Light PM 150 Software revision 2.0.
- Measures Vibration and temperature at the same time
- The temperature probe can measure temperatures between 0°C and 250°C
- It estimates and displays the saturation pressure by measuring the temperature. Useful for testing not only steam traps, but also valves
- One key operation for all functions
- Long battery life – 40 hours or more of continuous use
- It shut-offs automatically if the device is not in use for 5 minutes
- Includes a stop watch for monitoring periodic characteristics of vibrations
- Compact, lightweight and easy to carry

Software SurveyPro Light PM150 V2.0

Software for analyzing the data which had been measured by using the steam trap checker PM11 and for determining the condition of the steam trap. The software is available only in English version.

- Standard and Special versions available
- The new version allows the estimation of CO_2 emissions which correspond to leaking steam traps.
- Compatible with Windows XP, Vista and now with Windows 7 32 bit and 64 bit and Microsoft Office 2010 32 bit and 64 bit
- Full data compatibility. Data generated by the previous version can be integrated into the new software*
- The new version comes with an updated list of steam trap models of the main steam trap manufacturers.
- The new software allows a better classification of steam traps to various groups and areas inside a plant with the possibility for more detailed analysis of selected groups or areas.

* For more details please contact MIYAWAKI Inc. or an authorized representative

Working Flow

1 Tagging of Steam Traps

Put a tag on or text to each trap in your factory, so that it can be easily identified any time.

2 Survey List set-up

Run the Survey Pro Light software and fill in the basic information of the steam traps. Information such as survey list name, tag number, area, manufacturer, inlet pressure or size are filled in at this moment.

3 Traps inspection

Diagnose each trap on site using the checker PM11. Write down the vibration data measured for each trap.

4 Filling out of Survey List

Run again the Survey Pro Light software and enter the measured vibration data into the survey list for each trap. Once the vibration value of a trap has been entered, the operating condition of the trap will be displayed immediately. The list will also display the steam loss of each trap (if detected) and the related financial losses.

5 Analysis

After entering all test results of the survey, the software can show an analysis for each trap type and manufacturer, an analysis of steam losses and related financial losses for each manufacturer and trap type, an analysis of CO2 emission, or an analysis for kind of application (process, tracing, etc.), with the possibility of showing the results by areas or groups.

6 Trend Analysis

Comparisons can be made by Manufacturer, by the installed types, by the pressure classification and by applications. In each case the failure rate, the steam loss and money loss tendencies will be shown.

Technical Specification

Probes	Vibration	Piezo-electric-ceramic acceleration sensor (10K – 40 KHZ)	**Displays**	Illuminated liquid crystal display (LCD)
	Temperature	Thermistor Range: 0 – 250°C / 32 – 482°F	**Housing**	Heat-resistant plastic (ABS), simple waterproof design
Weight		230 g (incl. batteries)		
Power supply		2 x 1.5V AA alkaline batteries (40 hours or more) 2 x 1.2V AA NiMH (32 hours or more)	**Ambient working temperature**	0 – 40°C (32 – 104°F)

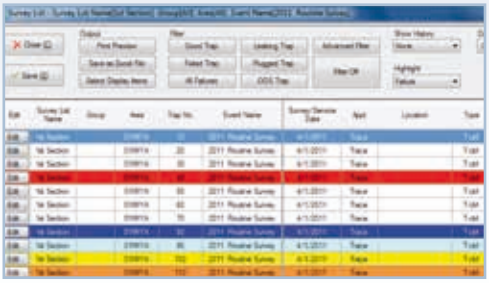
Steam Trap Survey Assistant

Dr. Trap® Jr.

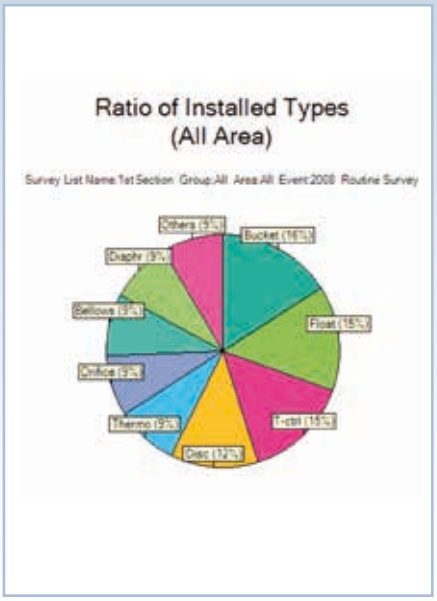
SurveyPro Light PM150 V2.0

Main Functions – Standard Version

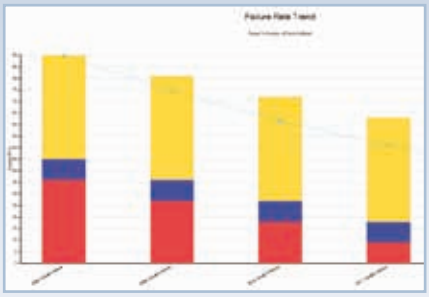
Survey List

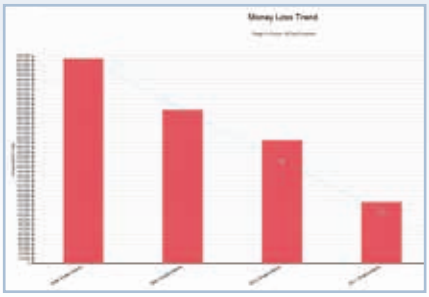


Analysis



Trend Analysis

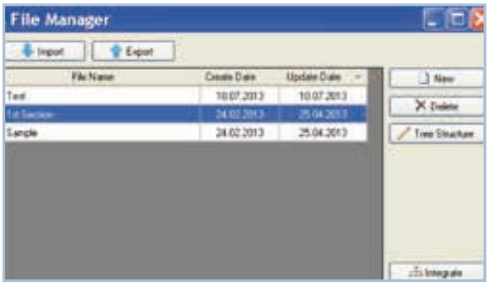




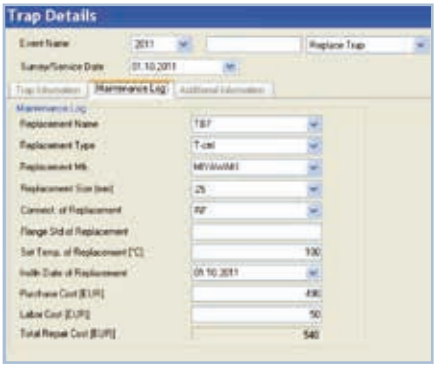
Additional Functions – Special Version

The Special Version includes the functions of the Standard Version plus the following ones:

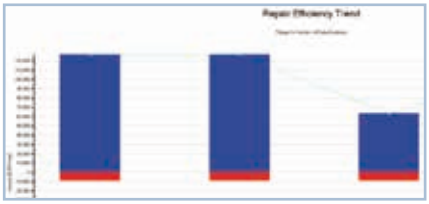
Integration of multiple survey files into a single one



Repair Cost Management



Repair Efficiency

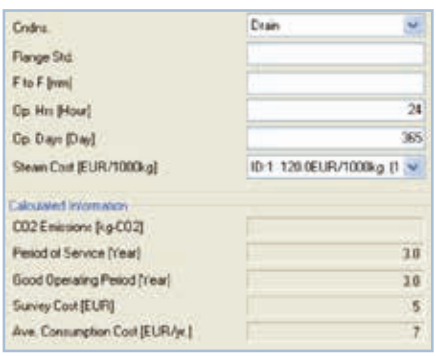


Management of other kind of failures

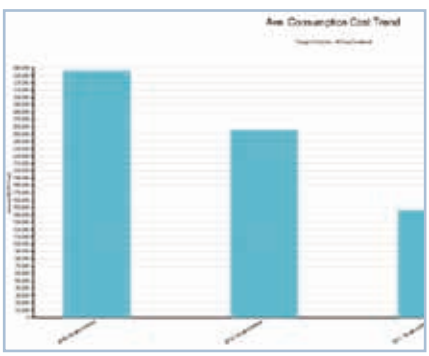
- Failure of inlet valve
- Failure of outlet valve
- Failure of other than valves

User and Ranking Summaries

Service Period



Average Consumption Cost



Advanced Steam Trap Management System

Dr. Trap®

PM301

Advanced Steam Trap Management System PM 301

Procesador PM310
It processes the data from the detector, displays and stores results.

Detector PM321
It detects the vibration and temperature in steam traps, which is used in their diagnosis.

Software
It can be run on a personal computer. It aggregates and analyzes steam trap data from the processor, identifying faulty steam traps, leaking traps, etc., making it easy to manage all of your traps. It provides detailed charts and graphs. Survey results are transferred from the processor to the computer using the Dr. Trap® management software.

Processor PM310

Detector PM321

NEW

Software SurveyPro Version 3.0

Features PM301

1. **High-speed Diagnosis**
   Each steam trap will be surveyed in less than 10 seconds. A normal trap without any leaks can be tested in only 4 seconds.
2. **Small and lightweight**
   The total weight of the processor and probe is only 580g (1.28lb), which means that it can be carried by a technician for an extended period of time without fatigue.
3. **Simple operation**
   A steam trap can be tested with a single press of the “OP” button on the probe. The processor design requires only simple actions be the operator, making it easy to learn how to use it.
4. **Can be used with high-pressure traps**
   Dr. Trap® can be used to test any trap at a wide range of pressures and at temperatures up to 500°C (932°F).
5. **Extended battery operation**
   The batteries allow approx. 12 hours of continuous operation. There is no need to replace the batteries in the middle of the journey.
6. **Large storage**
   The results of 1,000 steam traps checks can be stored in the processor´s memory.
7. **High-speed automatic analysis**
   The Dr. Trap® software provides automatic analysis and high-speed sorting of the collected data.

Software SurveyPro Light PM330 V3.0

Software for analyzing the data which had been measured by using the steam trap detector PM321 and for determining the condition of the steam trap. The software is available only in English version.

- Standard and Special versions available
- The new version allows the estimation of CO_2 emissions which correspond to leaking steam traps
- Compatible with Windows XP, Vista and now with Windows 7 32 bit and 64 bit and Microsoft Office 2010 32 bit and 64 bit
- Full data compatibility. Data generated by the previous version (V2.0) can be integrated into the new software*
- The new version comes with an updated list of steam trap models of the main steam trap manufacturers
- The new software allows a better classification of steam traps to various groups and areas inside a plant with the possibility for more detailed analysis of selected groups or areas.

* For more details please contact MIYAWAKI Inc. or an authorized representative.

Hardware	Weight		Sensor		Ambient working temperature		Max. ambient temperature		Power supply	Continuous operating (approximately)	Working survey time	Trap recording capacity
	g	lb	Vibration	Temperature	°C	°F	°C	°F		hours	seconds	Data
Processor PM 310	310 incl. battery and soft case	0.65	Piezo-electro-ceramic accelerometer	Infrared sensor (thermopile)	0 – 40	32 – 104	500	932	2 x 1.2V AA size rechargeable batteries	12 9 hours with the LCDs lit continuously	10 (2 minimum)	1000 maximum
Detector PM 321	270	0.58										

Display: LCD (16 caracteres x 2 líneas)

Software	Medium	Environment					
		Personal Computer	Operating System	Memory (RAM)	Hard disk	Display resolution (pixel)	Display colors
SurveyPro PM330 V3.0	CD-ROM	general-purpose	MS Windows XP, Vista or Windows 7 32 or 64 bits	256 MB or more	50 MB or more	800 x 600 or more	256 or more

Advanced Steam Trap Management System

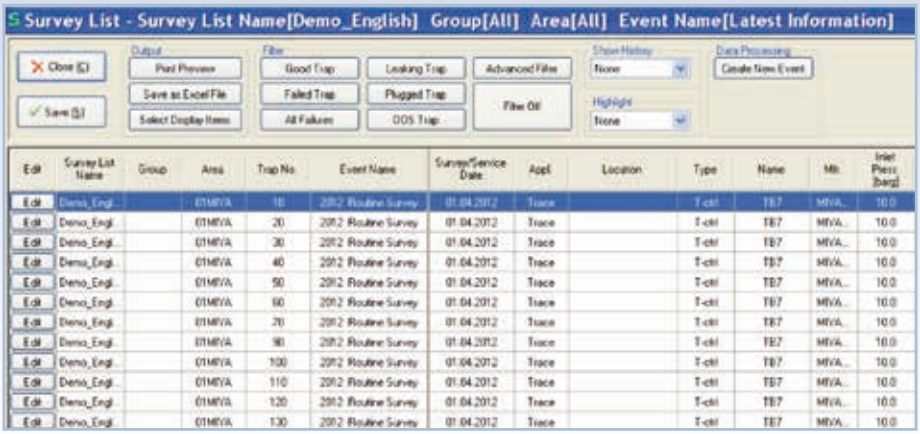
Dr. Trap®

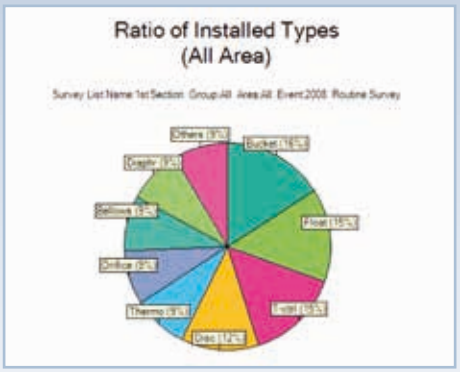
SurveyPro PM330 V3.0

Main Functions - Standard Version

Survey List

Survey lists are automatically generated from the test results of all traps which have been checked. Furthermore, failed steam traps can be extracted from the management log to make a separate list and to show the volume of steam that is leaking.





Data analysis

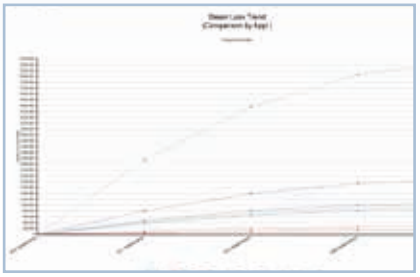
The software can show steam losses and related financial losses by trap type and manufacturer, analysis of C02 emissions which correspond to the steam losses or summaries by type of application or by areas or groups.

Trend Analysis

Results of past steam trap surveys can be compared according to specific users´ criteria. The software can perform the following trend analysis:

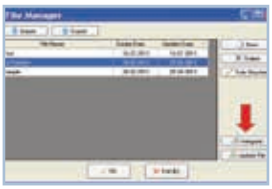
- Failure Rate Trend
- Steam and Money Loss Trends

Or a combination of them. The trends can also be compared and shown by manufacturer, trap type, pressure rating or application.



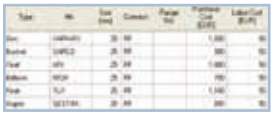
Additional Functions – Special Version

The Special Version includes the functions of the Standard Version plus the following ones:



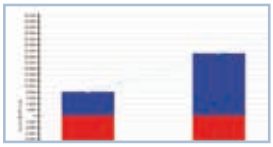
Integration of multiple survey files into a single one.

You can improve your plant analysis by putting together steam trap survey lists of different plant areas or groups into a single one by using the function “Integrate Multiple Files”.



Repair Cost Management.

In addition to steam loss costs, this function takes into account other important costs such as operating costs, trap purchasing costs, inspection costs or repair costs. Very useful for annual budgeting.



Repair Efficiency.

It is the judgment criteria to know whether the Repair Cost has been effectively used or not.

Customized summaries.

The results of the steam trap surveys can be sorted according to the user´s needs so that one can identify which installed traps are not suitable for the application.

Service Period

This function shows the time (in years) between the trap installation date and the trap replacement date.

Average Consumption cost

This function estimates the average consumption cost by taking into account the total repair cost, survey cost, Money loss due to a leak and the Period of Service.

Management of other kind of failures.

It shows the information about other devices that are installed around the steam traps. It allows to include into the survey list items like Failure of Inlet Valve, Failure of Outlet Valve or Failure of other than Valves.

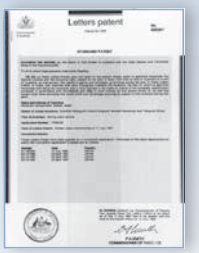
MIYAWAKI-Technology

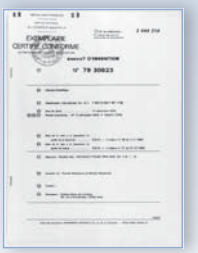
SCCV®-System

The MIYAWAKI SCCV®-System:
worldwide patented

MIYAWAKI's internationally patented Self Closing and Centering Valve SCCV®-System has proven its high reliability and effectiveness during more than two decades. Many thousands of steam traps equipped with the SCCV®-System have proven enormous advantages for our customers:

1. a substantially longer life compared with other steam traps
2. no partial or one-sided precipitate wear of valve and seat
3. greatly reduced wear of all internal parts due to the reduction of the closing forces required to maintain a seal
4. no steam loss for all Temperature Control Traps



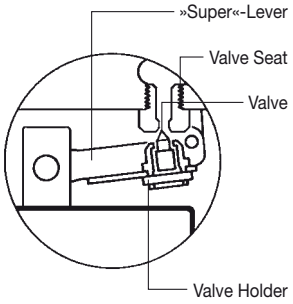


The MIYAWAKI SCCV®-System:
variable adjusted to various types

Intensive research and development activities over many years have enabled MIYAWAKI to incorporate the SCCV®-System in various types of steam traps. Thus it became possible to adopt the SCCV®-System to a wide pressure range and to utilize the SCCV®-System not only for Bimetal Steam Traps, but also for Inverted Bucket and Float Type Steam Traps.

Inverted Bucket Steam Traps

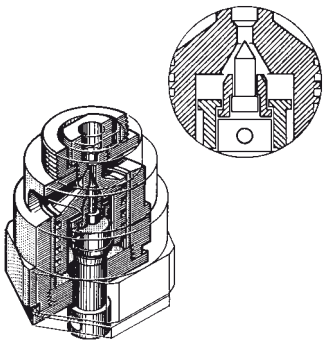
Series ES



The Valve Holder is fixed to a specially developed »Super-Lever«. The Valve is »free floating« inside the Valve Holder. Thus the control space inside the Valve Holder decreases the force toward the seat caused by the movement of the bucket. The Valve will close softly and exactly in the center of the seat.

Inverted Bucket Steam Traps

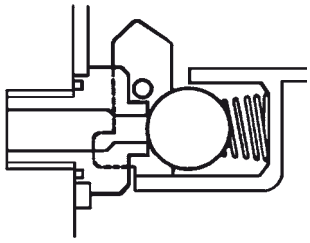
Series ER



The SCCV®-System is part of a »Double Valve Unit«, which is operating on the basis of the pressure difference inside the unit. The trap is thus characterized by extended life of the valve assembly and a greater condensate discharge per body size when compared to conventional Inverted Bucket steam traps.

Ball Float Steam Trap

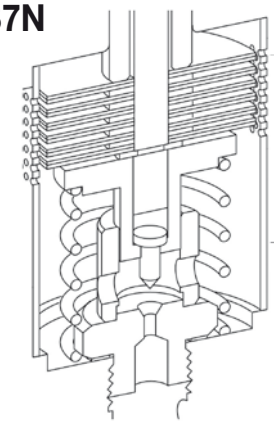
G11N, G12N



The Valve (Ball) lies inside a Valve Holder, which is directly connected through a lever with the float. By installing a spring inside the Valve Holder the movements of the float and the forces caused by it will not be directly transferred to the Valve. This will increase the service life of the sealing surfaces.

Temperature Control Steam Trap

TB7N



The Bimetal Unit including the Val-ve are guided inside the body. A spring reduces the force caused by the deflection of the bimetals which move the valve toward the seat. The guiding of the valve within the seat and the lift of the valve is designed in such a way that the Valve will close very smoothly in the center of the seat.

MIYAWAKI-Technology

SCCV®-System

Basic Principle

Regulating

The design of the Valve and Seat and the Valve lift (distance between the closed and open position of the valve) are calculated and designed in such a way that the valve closes its seat at the time that the condensate reaches the steam trap adjusted temperature.

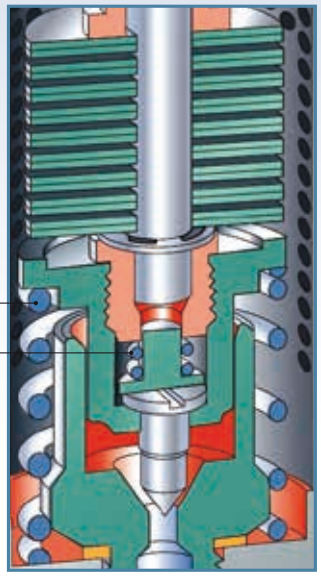
Centering and Soft Closing

The valve is “free floating” inside the valve holder. The valve moves to the center caused by the pressure and the flow of condensate. The tip of the valve is drawn down to the center axis of the valve seat.
A spring and a stop ring inside the control chamber absorbs and softens the movement of the valve (caused by the temperature and pressure of the steam system) towards its seat.
The centering and soft closing characteristics prevents premature or uneven wearing of the valve and its seat, extending the lifetime of the steam trap.

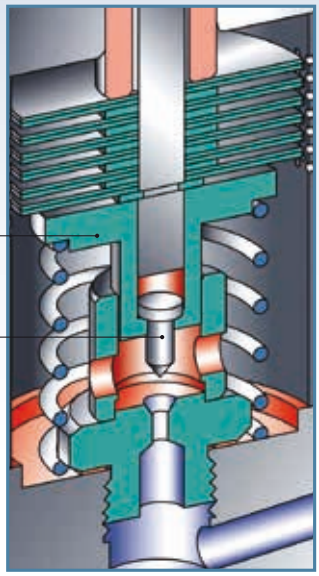
No Steam Loss

The valve closes exactly in the center of the seat at the adjusted temperature, slightly below the saturation temperature assuring Zero steam loss.

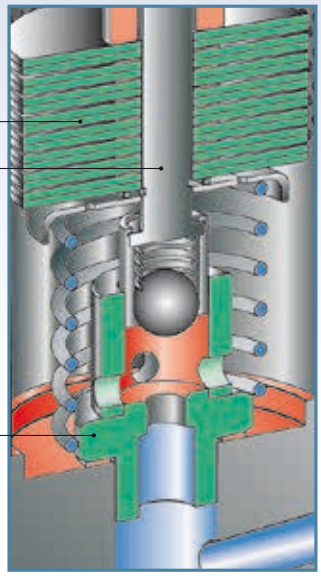
TB51



TB7N



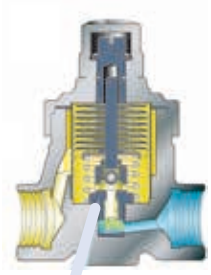
TB9N



1

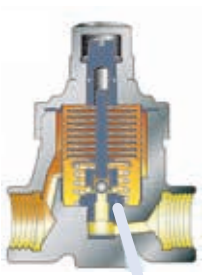
On start-up, the bimetal discs are all flat and the valve shaft is up with the valve fully open. Virtually all cold condensate and air are discharged.

2



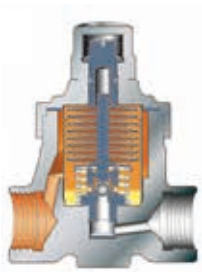
As the temperature of the condensate increases, the bimetal discs begin to curve gradually and force the valve shaft and the valve holder to move down.

3



When condensate with higher temperature (near to set temperature) flows in, the bimetal discs are curved even more and, at the same time, the valve shaft moves down and the valve holder closes the holes in the guide partially.

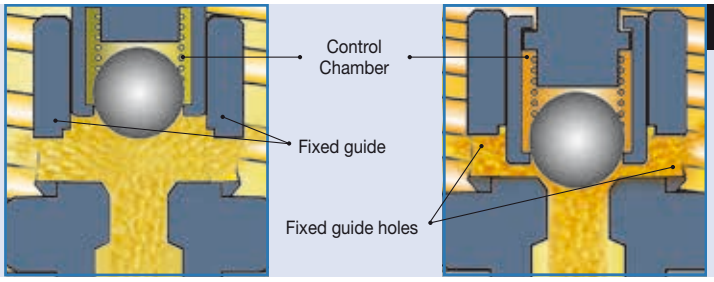
4



In case of very low condensate flow, the holes in the guide are closed completely by the valve holder and the valve will close precisely in the center of the seat. Normally, the trap is filled with hot condensate and the operation will rest in the state shown in figure 3. Condensate will be discharged continuously.

2

Most of the condensate is still discharged quickly, since the valve and the holes in the fixed guide on the valve seat are still fully open.



3

The amount of condensate being discharged is reduced quickly. This prolongs the time that the hot condensate stays near the bimetal discs and the heat of the condensate is transferred to the bimetals much more effectively.

Material Standards and Temperature

Material Standards

Following you find a list of materials mainly used by MIYAWAKI for its Steam Traps, according to Japanese Standards and the most closely corresponding numbers of American (ASTM), European (EN) and German (DIN) Standards.

1. Iron Castings

JIS	ASTM	EN	DIN
FC200	A48 – class 30	EN-GJL-200	GG-20 (0.6020)
FC250	A48 – class 35	EN-GJL-250 (EN-JL 1040)	GG-25 (0.6025)
FCD450	A536 65-45-12	EN-GJS-400-18U-LT (EN-JS1049)	GGG 40.3 (0.7043)

2. Steel Casting and Forgings

JIS	ASTM	EN	DIN
SCPH 2	A216 WCB	GP240 GH (1.0619)	GS-C25
SCPH 21	A217 WC6	G17CrMo 5-5 (1.7357)	GS17 CrMo 55 (1.7357)
SCPH32	A 217 WC9	GS12 CrMo 9-10 (1.7380)	10CrMo 9-10 (1.7380)
SFVC 2A	A105	P250GH (1.0460)	C22.8 (1.0460)
SFVA F22B	A182 F22	10CrMo 9-10 (1.7380)	10CrMo 9-10 (1.7380)

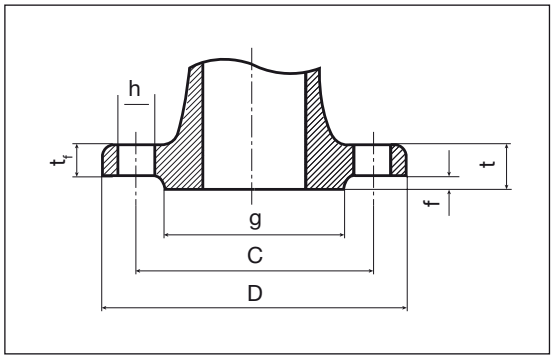
3. Stainless and Heat Resisting Steels

JIS	ASTM	EN	DIN
SCS13A	A351 CF8	GX5 CrNi19-10 (1.4308)	G-X6 CrNi189 (1.4308)
SCS14	A351 CF8M	GX5 CrNiMo19-11-2 (1.4408)	G-X6 CrNiMo1810 (1.4408)
SUS303	A582 S30300	X8 CrNiS18-9 (1.4305)	X10 CrNiS189 (1.4305)
SUS304	A276 S30400	X5 CrNi18-10 (1.4301)	X5 CrNi1810 (1.4301)
SUS403	A276 S40300	X6 Cr13 (1.4000)	X6 Cr13 (1.4000)
SUS420J2	–	X30 Cr13 (1.4028)	X30 Cr13 (1.4028)

4. Alloys

JIS	ASTM	EN	DIN
C3771	C37700 (B 124-89)	CuZn39Pb2 (CW612N)	CuZn39Pb2

Diameters and Drilling of Flanges (see Page 77)



Conversion Factors

$$T°C = \frac{5}{9} T°F - 32 \qquad T°F = 1{,}8\ T°C + 32$$

°C	°F / °C	°F	°C	°F / °C	°F
10,0	50	122	127	260	500
12,8	55	131	132	270	518
15,6	60	140	138	280	536
18,3	65	149	143	290	554
21,1	70	158	149	300	572
23,9	75	167	154	310	590
26,7	80	176	160	320	608
29,2	85	185	166	330	626
32,2	90	194	171	340	644
35,0	95	203	177	350	662
37,8	100	212	182	360	680
40,6	105	221	188	370	698
43	110	230	193	380	716
46	115	239	199	390	734
49	120	248	204	400	752
52	125	257	210	410	770
54	130	266	216	420	788
57	135	275	221	430	806
60	140	284	227	440	824
63	145	293	232	450	842
66	150	302	238	460	860
68	155	311	243	470	878
71	160	320	249	480	896
74	165	329	254	490	914
77	170	338	260	500	932
79	175	347	266	510	950
82	180	356	271	520	968
85	185	365	277	530	986
88	190	374	282	540	1004
91	195	383	288	550	1022
93	200	392	293	560	1040
99	210	410	299	570	1058
104	220	428	304	580	1076
110	230	446	310	590	1094
116	240	464	316	600	1112
121	250	482			

American Standard ASME B 16.5-2009

Size (in)	Dimensions	class 150		class 300		class 600		class 900		class 1500	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
1/2"	D	3.5	90	3.75	95	3.75	95	4.75	120	4.75	120
	t_f	0.38	9,6	0.5	12,7	0.56	14,3	0.88	22,3	0.88	22,3
	f	0.06	2	0.06	2	0.25	7	0.25	7	0.25	7
	g	1.38	34,9	1.38	34,9	1.38	34,9	1.38	34,9	1.38	34,9
	C	2.38	60,3	2.62	66,7	2.62	66,7	3.25	82,6	3.25	82,6
	n x h	4 x 5/8	4 x 15,9	4 x 5/8	4 x 15,9	4 x 5/8	4 x 15,9	4 x 7/8	4 x 22,2	4 x 7/8	4 x 22,2
3/4"	D	3.88	100	4.62	115	4.62	115	5.12	130	5.12	130
	t	0.44	11,2	0.56	14,3	0.62	15,9	1	25,4	1	25,4
	f	0.06	2	0.06	2	0.25	7	0.25	7	0.25	7
	g	1.69	42,9	1.69	42,9	1.69	42,9	1.69	42,9	1.69	42,9
	C	2.75	69,9	3.25	82,6	3.25	82,6	3.5	88,9	3.5	88,9
	n x h	4 x 5/8	4 x 15,9	4 x 3/4	4 x 19,0	4 x 3/4	4 x 19,0	4 x 7/8	4 x 22,2	4 x 7/8	4 x 22,2
1"	D	4.25	110	4.88	125	4.88	125	5.88	150	5.88	150
	t	0.5	12,7	0.62	15,9	0.69	17,5	1.12	28,6	1.12	28,6
	f	0.06	2	0.06	2	0.25	7	0.25	7	0.25	7
	g	2	50,8	2	50,8	2	50,8	2	50,8	2	50,8
	C	3.12	79,4	3.5	88,9	3.5	88,9	4	101,6	4	101,6
	n x h	4 x 5/8	4 x 15,9	4 x 3/4	4 x 19,0	4 x 3/4	4 x 19,0	4 x 1	4 x 25,4	4 x 1	4 x 25,4
1 1/4"	D	4.62	115	5.25	135	5.25	135	6.25	160	6.25	160
	t	0.56	14,3	0.69	17,5	0.81	20,7	1.12	28,6	1.12	28,6
	f	0.06	2	0.06	2	0.25	7	0.25	7	0.25	7
	g	2.5	63,5	2.5	63,5	2.5	63,5	2.5	63,5	2.5	63,5
	C	3.5	88,9	3.88	98,4	3.88	98,4	4.38	111,1	4.38	111,1
	n x h	4 x 5/8	4 x 15,9	4 x 3/4	4 x 19,0	4 x 3/4	4 x 19,0	4 x 1	4 x 25,4	4 x 1	4 x 25,4
1 1/2"	D	5	125	6.12	155	6.12	155	7	180	7	180
	t	0.62	15,9	0.75	19,1	0.88	22,3	1.25	31,8	1.25	31,8
	f	0.06	2	0.06	2	0.25	7	0.25	7	0.25	7
	g	2.88	73	2.88	73	2.88	73	2.88	73	2.88	73
	C	3.88	98,4	4.5	114,3	4.5	114,3	4.88	123,8	4.88	123,8
	n x h	4 x 5/8	4 x 15,9	4 x 7/8	4 x 22,2	4 x 7/8	4 x 22,2	4 x 1 1/8	4 x 28,6	4 x 1 1/8	4 x 28,6
2"	D	6	150	6.5	165	6.5	165	8.5	215	8.5	215
	t	0.69	17,5	0.81	20,7	1	25,4	1.5	38,1	1.5	38,1
	f	0.06	2	0.06	2	0.25	7	0.25	7	0.25	7
	g	3.62	92,1	3.62	92,1	3.62	92,1	3.62	92,1	3.62	92,1
	C	4.75	120,7	5	127	5	127	6.5	165,1	6.5	165,1
	n x h	4 x 3/4	4 x 19,0	8 x 3/4	8 x 19,0	8 x 3/4	8 x 19,0	8 x 1	8 x 25,4	8 x 1	8 x 25,4

Japanese Standard: JIS B 2210 – 1984

Size (in)	Dimensions	Dimensions at Pressure Rating (mm)					
		10 K	16 K	20 K	30 K	40 K	63 K
1/2"	D	95	95	95	115	115	120
	t	12	12	14	18	20	23
	f	1	1	1	1	1	1
	g	51	51	51	55	55	55
	C	70	70	70	80	80	80
	n x h	4 x 15	4 x 15	4 x 15	4 x 19	4 x 19	4 x 19
3/4"	D	100	100	100	120	120	135
	t	14	14	16	18	20	25
	f	1	1	1	1	1	1
	g	56	56	56	60	60	60
	C	75	75	75	85	85	95
	n x h	4 x 15	4 x 15	4 x 15	4 x 19	4 x 19	4 x 23
1"	D	125	125	125	130	130	140
	t	14	14	16	20	22	27
	f	1	1	1	1	1	1
	g	67	67	67	70	70	70
	C	90	90	90	95	95	100
	n x h	4 x 19	4 x 19	4 x 19	4 x 19	4 x 19	4 x 23
1 1/4"	D	135	135	135	140	140	150
	t	16	16	18	22	24	30
	f	2	2	2	2	2	2
	g	76	76	76	80	80	80
	C	100	100	100	105	105	110
	n x h	4 x 19	4 x 19	4 x 19	4 x 19	4 x 19	4 x 23
1 1/2"	D	140	140	140	160	160	175
	t	16	16	18	22	24	32
	f	2	2	2	2	2	2
	g	81	81	81	90	90	90
	C	105	105	105	120	120	130
	n x h	4 x 19	4 x 19	4 x 19	4 x 23	4 x 23	4 x 25
2"	D	155	155	155	165	165	185
	t	16	16	18	22	26	34
	f	2	2	2	2	2	2
	g	96	96	96	105	105	105
	C	120	120	120	130	130	145
	n x h	4 x 19	8 x 19	8 x 19	8 x 19	8 x 19	8 x 23

European Standard EN 1092-1

Size (DN)	Dimensions	PN 10	PN 16	PN 25	PN 40	PN 63	PN 100
		mm	mm	mm	mm	mm	mm
15	D	95	95	95	95	105	105
	t	16	16	16	16	20	20
	f	2	2	2	2	2	2
	g	45	45	45	45	45	45
	C	65	65	65	65	75	75
	n x h	4 x 14	4 x 14	4 x 14	4 x 14	4 x 14	4 x 14
20	D	105	105	105	105	130	130
	t	18	18	18	18	22	22
	f	2	2	2	2	2	2
	g	58	58	58	58	58	58
	C	75	75	75	75	90	90
	n x h	4 x 14	4 x 14	4 x 14	4 x 14	4 x 18	4 x 18
25	D	115	115	115	115	140	140
	t	18	18	18	18	24	24
	f	2	2	2	2	2	2
	g	68	68	68	68	68	68
	C	85	85	85	85	100	100
	n x h	4 x 14	4 x 14	4 x 14	4 x 14	4 x 18	4 x 18
32	D	140	140	140	140	155	155
	t	18	18	18	18	24	24
	f	2	2	2	2	2	2
	g	78	78	78	78	78	78
	C	100	100	100	100	110	110
	n x h	4 x 18	4 x 18	4 x 18	4 x 18	4 x 22	4 x 22
40	D	150	150	150	150	170	170
	t	18	18	18	18	26	26
	f	2	2	2	2	2	2
	g	88	88	88	88	88	88
	C	110	110	110	110	125	125
	n x h	4 x 18	4 x 18	4 x 18	4 x 18	4 x 22	4 x 22
50	D	165	165	165	165	180	195
	t	18	18	20	20	26	28
	f	2	2	2	2	2	2
	g	102	102	102	102	102	102
	C	125	125	125	125	135	145
	n x h	4 x 18	4 x 18	4 x 18	4 x 18	4 x 22	4 x 26

Pressure

Conversion Table from psi to bar

psi		bar		psi		bar		psi		bar		psi		bar		psi		bar		psi		bar	
1		0,07		105		7,24		310		21,37		510		35,17		820		56,55		1250		86,19	
	1,5		0,1		108,8		7,5		319,0		22,0		514,8		35,5		826,5		57,0		1276		88,0
5		0,34		110		7,58		320		22,06		520		35,86		840		57,93		1300		89,66	
	7,3		0,5		116,0		8,0		326,3		22,5		522,0		36,0		855,5		59,0		1305		90,0
10		0,69		120		8,27		330		22,75		530		36,55		860		59,31		1350		93,08	
	14,5		1,0		123,3		8,5		333,5		23,0		536,5		37,0		870,0		60,0		1378		95,0
15		1,03		130		8,96		340		23,44		540		37,24		880		60,69		1400		96,55	
	18,9		1,3		130,5		9,0		348,0		24,00		543,8		37,5		899,0		62,0		1407		97,0
20		1,38		140		9,65		350		24,13		550		37,92		900		62,06		1450		100,00	
	21,8		1,5		145,0		10,00		355,3		24,5		551,0		38,0		913,5		63,0		1479		102,0
25		1,72		150		10,34		360		24,82		560		38,62		920		63,45		1500		103,45	
	29,0		2,0		159,5		11,0		362,5		25,0		565,5		39,0		928,0		64,0		1523		105,0
30		2,07		160		11,03		370		25,51		570		39,31		940		64,83		1550		106,87	
	33,4		2,3		166,8		11,5		377,0		26,00		572,8		39,5		942,5		65,0		1595		110,0
35		2,41		170		11,72		380		26,20		580		40,00		960		66,21		1600		110,32	
	36,3		2,5		174,0		12,0		384,3		26,5		587,3		40,5		971,5		67,0		1624		112,0
40		2,76		180		22,41		390		26,89		590		40,69		980		67,59		1650		113,77	
	43,5		3,0		188,5		13,0		391,5		27,0		594,5		41,0		986,0		68,0		1668		115,0
45		3,10		190		13,10		400		27,85		600		41,37		1000		68,95		1700		117,22	
	47,9		3,3		195,8		13,5		406,0		28,0		609,0		42,0		1015		70,0		1711		118,0
50		3,45		200		13,79		410		28,27		620		42,76		1020		70,34		1750		120,66	
	50,8		3,5		203,0		14,0		413,3		28,5		623,5		43,0		1029		71,0		1784		123,0
55		3,79		210		14,48		420		28,96		640		44,14		1040		71,72		1800		124,11	
	58,0		4,0		217,5		15,0		420,5		29,0		652,5		45,0		1044		72,0		1813		125,0
60		4,14		220		15,17		430		29,65		660		45,52		1060		73,10		1850		127,56	
	62,4		4,3		224,8		15,5		435,0		30,0		667,0		46,0		1073		74,0		1885		130,0
65		4,48		230		15,86		440		30,34		680		46,90		1080		74,48		1900		131,01	
	65,3		4,5		232,0		16,0		449,5		31,0		696,0		48,0		1088		75,0		1929		133,0
70		4,83		240		16,55		450		31,03		700		48,27		1100		75,86		1950		134,45	
	72,5		5,0		246,5		17,0		456,8		31,5		710,5		49,0		1117		77,0		1958		135,0
75		5,17		250		17,24		460		31,72		720		49,66		1120		77,24		2000		137,90	
	79,8		5,5		253,8		17,5		464,0		32,0		725,0		50,0		1131		78,0		2030		140,0
80		5,52		260		17,93		470		32,41		740		51,03		1140		78,62		2050		141,35	
	82,7		5,7		261,0		18,0		478,5		33,0		754,0		52,0		1146		79,0		2074		143,0
85		5,86		270		18,62		480		33,10		760		52,41		1160		80,00		2100		144,80	
	87,0		6,0		275,5		19,0		485,8		33,5		768,5		53,0		1175		81,0		2103		145,0
90		6,21		280		19,31		490		33,79		780		53,79		1180		81,38		2150		148,24	
	94,3		6,5		282,8		19,5		493,0		34,0		797,5		55,0		1189		82,0		2175		150,0
95		6,55		290		20,00		500		34,48		800		55,16		1200		82,76		2200		151,69	
	97,2		6,7		297,3		20,5		507,5		35,0				56,0		1233		85,0		2320		160,0
100		6,9		300		20,69																	
	101,5		7,0		304,5		21,0																

Conversion Factors

Units of measurement								
Pa	KPa	MPa	bar	kg/cm^2	atm	mm H_20	mm Hg (Torr)	lbf/in^2 (psi)
1	0,001	1×10^{-6}	1×10^{-5}	$1{,}01972 \times 10^{-5}$	$9{,}86923 \times 10^{-6}$	0,101972	$7{,}50062 \times 10^{-3}$	$1{,}450377 \times 10^{-4}$
1000	1	0,001	0,01	0,0101972	$9{,}86923 \times 10^{-3}$	101,972	7,50062	0,1450377
1×10^6	1000	1	10	10,1972	9,86923	$1{,}01972 \times 10^5$	7500,62	145,0377
1×10^5	100	0,1	1	1,01972	0,986923	$1{,}01972 \times 10^4$	750,062	14,50377
$9{,}80665 \times 10^4$	98,0665	0,0980665	0,980665	1	0,967841	10000	735,559	14,22334
$1{,}01325 \times 10^5$	101,325	0,101325	1,01325	1,03323	1	10332,3	760,000	14,69595
9,80665	$9{,}80665 \times 10^{-3}$	$9{,}80665 \times 10^{-6}$	$9{,}80665 \times 10^{-5}$	0,0001	$9{,}67841 \times 10^{-5}$	1	0,0735559	0,001422334
133,322	0,133322	$1{,}33222 \times 10^{-4}$	0,00133322	0,00135951	0,00131579	13,5951	1	0,01933678
6894,76	6,89476	0,00689476	0,0689476	0,0703070	0,0680460	703,070	51,7149	1

Properties of Saturated Steam

Absolute Pressure	Saturation Temperature	Steam Volume	Steam Density	Sensible Heat	Total Steam Heat	Latent Heat
p bar	**ts** °C	**v˝** m^3/kg	**ϱ˝** kg/m^3	**h΄** kJ/kg	**h˝** kJ/kg	**r = h˝ - h΄** kJ/kg
1,0	99,63	1,6940	0,5904	417,51	2.675,4	2.257,9
1,5	111,37	1,1590	0,8628	467,13	2.693,4	2.226,3
2,0	120,23	0,8854	1,1290	504,70	2.706,3	2.201,6
2,5	127,43	0,7184	1,3920	535,34	2.716,4	2.181,1
3,0	133,54	0,6056	1,6510	561,43	2.724,7	2.163,3
3,5	138,87	0,5240	1,9080	584,27	2.731,6	2.147,3
4,0	143,62	0,4622	2,1630	604,67	2.737,6	2.132,9
4,5	147,92	0,4138	2,4170	623,16	2.742,9	2.119,7
5,0	151,84	0,3747	2,6690	640,12	2.747,5	2.107,4
5,5	155,46	0,3426	2,9200	655,78	2.751,7	2.095,9
6,0	158,84	0,3155	3,1700	670,42	2.755,5	2.085,1
6,5	161,99	0,2925	3,4190	684,12	2.758,8	2.074,7
7,0	164,96	0,2727	3,6670	697,06	2.762,0	2.064,9
7,5	167,75	0,2554	3,9150	709,29	2.764,8	2.055,5
8,0	170,41	0,2403	4,1620	720,94	2.767,5	2.046,6
8,5	172,94	0,2268	4,4090	732,02	2.769,9	2.037,9
9,0	175,36	0,2148	4,6550	742,64	2.772,1	2.029,5
9,5	177,66	0,2040	4,9010	752,81	2.774,2	2.021,4
10,0	179,88	0,1930	5,1470	762,61	2.776,2	2.013,6
11,0	184,07	0,1747	5,6370	781,13	2.779,7	1.998,6
12,0	187,96	0,1632	6,1270	798,43	2.782,7	1.984,3
13,0	191,61	0,1511	6,6170	814,70	2.785,4	1.970,7
14,0	195,04	0,1407	7,1060	830,08	2.787,8	1.957,7
15,0	198,29	0,1317	7,5960	844,67	2.789,9	1.945,2
16,0	201,37	0,1237	8,0850	858,56	2.791,7	1.933,1
17,0	204,31	0,1166	8,5750	871,84	2.793,4	1.921,6
18,0	207,11	0,1103	9,0650	884,58	2.794,8	1.910,2
19,0	209,80	0,1047	9,5550	896,81	2.796,1	1.899,3
20,0	212,37	0,0996	10,0500	908,59	2.797,2	1.888,6
22,0	217,24	0,0907	11,0300	930,95	2.799,1	1.868,2
24,0	221,78	0,0832	12,0200	951,93	2.800,4	1.848,5
26,0	226,04	0,0769	13,0100	971,72	2.801,4	1.829,7
28,0	230,05	0,0714	14,0100	990,48	2.802,0	1.811,5
30,0	233,84	0,0666	15,0100	1.008,40	2.802,3	1.793,9
32,0	237,45	0,0624	16,0200	1.025,40	2.802,3	1.776,9
34,0	240,88	0,0587	17,0300	1.041,80	2.802,1	1.760,3
36,0	244,16	0,0554	18,0500	1.057,60	2.801,7	1.744,1
38,0	247,31	0,0524	19,0700	1.072,70	2.801,1	1.728,4
40,0	250,33	0,0498	20,1000	1.087,40	2.800,3	1.712,9
50,0	263,91	0,0394	25,3600	1.154,50	2.794,2	1.639,7
60,0	275,55	0,0324	30,8300	1.213,70	2.785,0	1.571,3
70,0	285,79	0,0274	36,5300	1.267,40	2.773,5	1.506,1
80,0	294,97	0,0235	42,5100	1.317,10	2.759,9	1.442,8
90,0	303,31	0,0205	46,7900	1.363,70	2.744,6	1.380,9
100,0	310,96	0,0180	55,4300	1.408,00	2.727,7	1.319,7
110,0	318,05	0,0160	62,4800	1.450,60	2.709,3	1.258,7
120,0	324,65	0,0143	70,0100	1.491,80	2.689,2	1.197,4
130,0	330,83	0,0128	78,1400	1.532,00	2.667,0	1.135,0
140,0	336,64	0,0115	86,9900	1.571,60	2.642,4	1.070,8
150,0	342,13	0,0103	86,7100	1.611,00	2.615,0	1.004,0
160,0	347,33	0,0093	107,4000	1.650,50	2.584,9	934,4
170,0	352,26	0,0084	119,5000	1.691,70	2.551,6	859,9
180,0	356,96	0,0075	133,4000	1.734,80	2.513,9	779,1
190,0	361,43	0,0067	149,8000	1.778,70	2.470,6	691,9
200,0	365,70	0,0059	170,2000	1.826,50	2.418,4	591,9
220,0	373,69	0,0037	268,3000	2.011,10	2.195,6	184,5
221,2	374,15	0,0032	315,5000	2.107,40	2.107,4	0,0

Pressure Equipment Directive 97/23/EC of the European Parliament and of the Council of 29 May 1997 Classification of MIYAWAKI Products

CERTIFICATE

The TÜV Rheinland Certification Body for Pressure Equipment hereby certifies that

MIYAWAKI INC.
Osaka, Japan

has been inspected and approved according to

AD 2000-Merkblatt W0

The scope of the inspection is given in the annex to this certificate. All pertinent requirements are met.

Among others, the above-mentioned company has facilities permitting manufacturing and inspection in conformity with the technical state of the art, operates a quality system which guarantees that manufacturing and inspection of the products stated in the scope are in conformity with the applicable technical codes and regulations, employs qualified supervisory and inspection personnel.

Certificate No. 01 202 J/AD-02 0028
valid until September 2014

Yokohama, Oct. 28, 2011 — TÜV Rheinland Certification Body for Pressure Equipment

Dipl.-Ing. Hauf

TÜV Rheinland Industrie Service GmbH, Am Grauen Stein, 51105 Cologne, GERMANY

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Certificate

Monitoring of Final Assessment
according to Directive 97/23/EC

Certificate No.: 01 202 J/Ü-4041923

Name and address of the manufacturer: MIYAWAKI INC. 2-1-30 Tagawakita, Yodogawa-ku Osaka 532-0021, JAPAN

According to the test results, the manufacturer is entitled to affix the following marking to the pressure equipment produced within the range of this module:

CE 0035

Tested acc. to Directive 97/23/EC: Internal manufacturing checks with monitoring of the final assessment (Module A1)

Test report no.: 4041923M

Description of pressure equipment: Gas or Steam Trap and valve in category I and II

Manufacturing plant: Miyawaki Inc. 2-1-30 Tagawakita, Yodogawa-ku Osaka 532-0021, JAPAN

The regular monitoring of the final assessment established that the requirements of the Directive are met. The next monitoring is due by end of October 2014.

Yokohama, Oct. 29, 2013 — TÜV Rheinland Certification Body for Pressure Equipment

Dipl.-Ing. Abe

TÜV Rheinland Industrie Service GmbH, Notified Body, ID Number 0035, Am Grauen Stein, 51105 Cologne, GERMANY

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In the course of the harmonization of the laws of the EC Member States concerning pressure equipment, the Pressure Equipment Directive 97/23/EC (PED) had been adopted in May 1997. The Directive came into effect on 30 May 2002.
According to the PED all manufacturers of pressure equipment covered by the PED, are under the obligation to subject each item of equipment to one of the conformity assessment procedures described in the PED. The conformity assesment procedures to be applied to an item of pressure equipment with a view to affixing the CE marking shall be determined by the category, in which the equipment is classified (see also Annex I & II of the PED). In this connection it is necessary to take into consideration the statement of the PED, that pressure equipment which is subject to Article 3, Section 3 of the PED "…must be designed and manufactured in accordance with the sound engineering practice of a Member State in order to ensure safe use. … Such equipment … must not bear the CE marking referred to in Article 15" of the PED. As all products which are classified under Article 3, Section 3 are not subject to any of the conformity assessment procedures it is not allowed to issue a written declaration of conformity for these products.
In cooperation with TÜV Rheinland/Berlin-Brandenburg MIYAWAKI Inc., Osaka, Japan examined all products with respect to the PED and certified its production process in accordance with Modul A1 of the PED (internal manufacturing checks with monitoring of the final assessment).

As a result of this certification process MIYAWAKI Inc. draw the following conclusions:

1. The following MIYAWAKI products are classified according to Article 3, Section 3 of the PED which does not allow to bear the CE marking and to issue a written declaration of conformity:

Steam Traps: TB1N, TBC2, TBC2B, TB7N, TB9N, TB51, TB52, TBH71, TBH72, W, DC1, DV1, DL1, DX1, DF1, S31N, SC31, SC, SF, SV, SL, SU2N, SU2H, SD1, S55N, S61N, S62N, ER105, ER110, ER116, ES5, ESU5, ES8N, ES10, ES12N, ESH8N, G11N, G12N, G15N, G3N-10R, G3N-16R, GH3N-10R, GH3N-16R (to DN65), G2, GH2, G4, GH4, GC1, GC20, G20

Steam Pressure Reducing Valves: RE1, RE2, RE3, REC1, RE10N

Steam-Water-Mixing Valve: MX1N

All above MIYAWAKI products are designed and manufactured in accordance with the sound engineering practice as requested by the PED. On request MIYAWAKI will issue a Manufacturer Declaration of Quality.

2. Steam traps not included into point 1 belong to category I (Modul A) or category II (Modul A1) according to Annex II & III of the PED. They will bear the CE marking and the conformity with the PED will be confirmed by issuing a declaration of conformity.

CE

As a result of the certification by TÜV Rheinland/Berlin-Brandenburg MIYAWAKI can assure all our customers of its continuing policy of high quality standards and of the fact, that all products are manufactured in accordance with the regulations and technical requirements of the EC.

MEMO

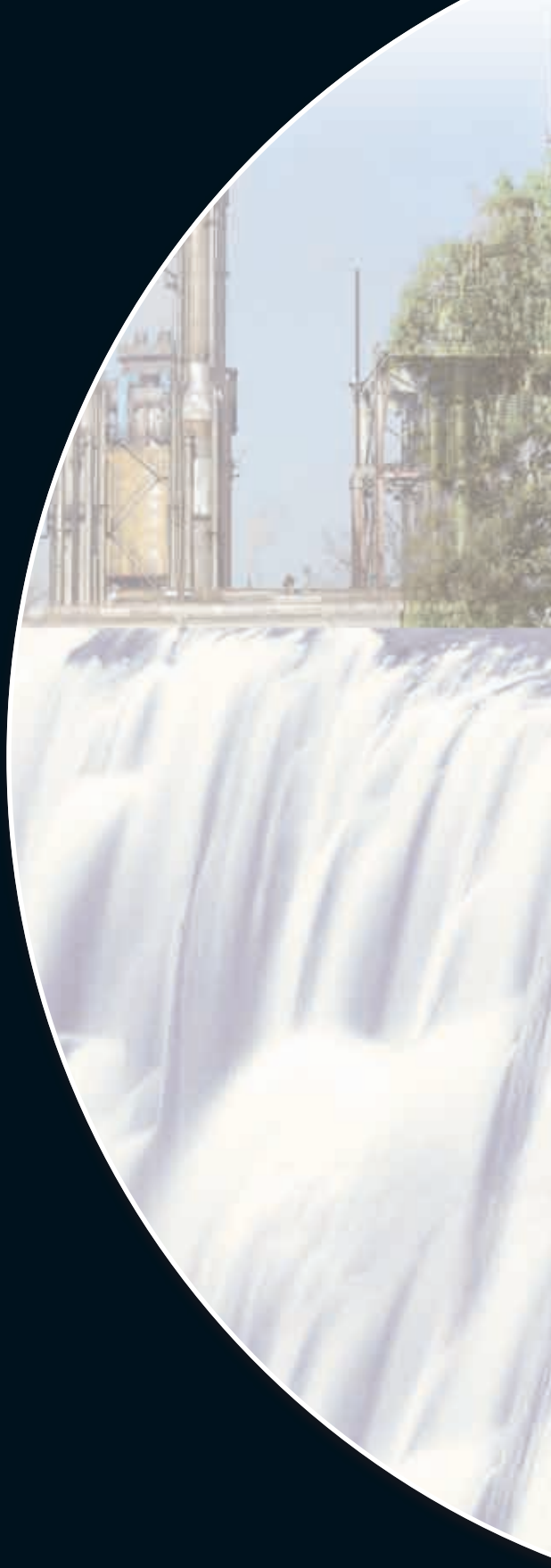
MIYAWAKI®

www.miyawaki.net

Environmentally friendly through reduced energy usage and improved steam efficiency.

English Edition 2014 (1) © MIYAWAKI GmbH

In the interest of the development and improvement of our products, MIYAWAKI Inc. reserves the right to change the specification of the products.



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